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A-E PERFORMANCE SPECIFICATION

PROJECT FILE NO. 021052

OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT

Weather Enclosure Structure WMF-671

Prepared for:
U.S. Department of Energy
Idaho Operations Office
Idaho Falls, Idaho

Idaho National Engineering and Environmental Laboratory

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1. SCOPE

1.1 General

The Subcontractor [shall] design, furnish, ship to the site, and supervise the installation of a frame-supported, tensioned-membrane (fabric) building system, complete, as shown on the attached drawings and as specified herein. This building will function as a weather protection enclosure for a modular steel building and excavator contained within. Therefore, the building is entitled the "Weather Enclosure Structure" (WES). The pertinent conceptual drawings are included at the rear of this specification section to provide a general overview of the enclosure. The building will be erected on a steel platform the full width and length of the fabric structure as shown on S-1 of the included drawings.

1.2 Work Included

The work includes, but is not limited to the design, manufacturing, and installation phases, as described below.

1.2.1 Design Phase

The subcontractor shall design the fabric structure per the specifications and conceptual drawings included herein. Deliverables produced during the design effort will include calculations and drawings. The fabric structure manufacturer shall provide an engineer or engineers to prepare the preliminary design at Idaho Falls, Idaho in coordination with BBWI. Final design work may be completed at the manufacturer's place of business using approved drawings prepared at Idaho Falls.

Specific deliverables required at the end of the design work phase are "D" size, shop drawings illustrating construction details, structural calculations and product literature depicting all parts and materials of the structure.

The design phase shall begin as soon as possible after award. A design review will be held at 90% complete to review drawings and calculations prior to completion of the design. At the conclusion of the design review period a meeting will be held to discuss and review comments. Comments shall be answered formally in writing and resolved. Comment incorporation will take place prior to completion of the design phase. Date of the review meeting is yet to be determined.

1.2.2 Manufacturing Phase

The fabric structure will be manufactured and shipped to the INEEL for erection by a General Subcontractor. INEEL quality representatives and design engineers will make in-plant inspection of the fabrication process.

1.2.3 Installation Phase

The building manufacturer will provide a full time installation supervisor to oversee the erection of the fabric structure. The INEEL Site Stabilization Agreement requires site construction by workers supplied by local trade unions. Therefore, the building erection will be by local union ironworkers.

1.3 Work Not Included

Erection of the building.

1.4 Related Structures

Retrieval Confinement Structure (RCS), reference drawings attached as Appendix D.

Facility Floor Structure (FFS)

2. QUALIFICATIONS

The design, fabrication, and erection supervision of the prefabricated tension membrane structural system shall be accomplished by a manufacturer who has been engaged in the fabrication of similar structures of type and quality indicated for at least 10 years. All design work shall be done by Professional Engineers registered in the State of Idaho to practice civil or structural engineering with at least 5 years experience in the design of this type of structure. All drafting work shall be done on the latest release of AutoCad by experienced drafters with at least 2 years experience working on this type of building. Erection supervision will be performed by a person with at least 10 years experience installing buildings of this type.

3. APPLICABLE CODES, PROCEDURES, AND REFERENCES

3.1 Codes and Standards

The following Codes and Standards, including others referenced therein, form a part of this Section to the extent specified herein.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC (ASD) Specification for Structural Steel for Buildings--Allowable Stress Design (ASD)

AMERICAN IRON AND STEEL INSTITUTE (AISI)

SG 503-76 The Design and Fabrication of Cold-Formed Steel Structures

AMERICAN NATIONAL STANDARDS INSTITUTE/ BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (ANSI/BHMA)

ANSI/BHMA A156.2 Bored and Preassembled Locks and Latches
ANSI/BHMA A156.6 Thresholds and Kickplates
ANSI/BHMA A156.18 Materials and Finishes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 36 Structural Steel
A 123 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
A 307 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
A 325 High-Strength Bolts for Structural Steel Joints
A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A 563 Carbon and Alloy Steel Nuts
A 687 High-Strength Non-Headed Steel Bolts and Studs.
A 992 Steel for Structural Shapes for Use in Building Framing

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7-98 Minimum Design Loads for Building and Other Structures

AMERICAN WELDING SOCIETY (AWS)

D1.1 Structural Welding Code – Steel

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

ICBO IBC 2000 International Building Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

Standard Methods of Fire Tests for Flame Resistant Textiles and Films

NFPA 70 National Electrical Code

RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS

Specification for Structural Joints Using ASTM A325 or A490 Bolts

3.2 Drawings

See drawings attached as Appendix B.

4. SUBMITTALS

4.1 General

General Procedures: Vendor data, whether prepared by the Subcontractor or Subcontractor's subtier or supplier, shall be submitted as instruments of the Subcontractor. Therefore, prior to submittal, the Subcontractor shall ascertain that material and equipment covered by the submittal and the contents of the submittal itself, meet all the requirements of the subcontract specifications, drawings, or other contract documents.

Each submittal shall contain identification for each separable and separate piece of material or equipment, and literature concerning the information provided in the specification and on the Vendor Data Schedule. Submittals shall be numbered consecutively for each different submittal.

Vendor Data Schedule: Vendor Data required by this specification or the drawings to support design, construction, and operation of the project is identified on the Vendor Data Schedule included in Appendix A. The Vendor Data Schedule provides a tabular listing by item number, drawing or specification reference, and description of the item or service.

The type of submittal is identified by a "Vendor Data Code", and the time required to submit the item is identified by a "When to Submit" code. An "Approval" code specifies whether the submittal is for Mandatory Approval or for Information Only. One copy of routine paper or electronic file submittals is required; additional copies may be required by the Vendor Data Schedule. Electronic file submittals are preferred.

Construction Vendor Data Transmittal and Disposition Form: All vendor data shall be submitted to the Contractor using the Construction Vendor Data Transmittal and Disposition Form. The form provides the Subcontractor a convenient method to submit vendor data and provides the Contractor a means of dispositioning the submittal. The Subcontractor shall list the Vendor Data Schedule item number, a Vendor Data Transmittal tracking number (if applicable), the drawing or specification number reference, a Tag Number (if applicable), the submittal status (e.g., Mandatory Approval, Information Only, Re-submittal, or Or-equal), the Revision Level, and the Item Description. The description should include the heat or lot number for items requiring Certified Mill Test Reports.

Disposition by the Contractor: The Contractor's comments and required action by the Subcontractor will be indicated by a disposition code on the submittal. The disposition codes will be classed as follows:

(A) "Work May Proceed." Submittals so noted will generally be classed as data that appears to be satisfactory without corrections."

(B) "Work May Proceed with Comments Incorporated. Revise Affected Sections and Resubmit."

(C) "Work May NOT Proceed. Revise and Resubmit." Submittals so dispositioned will require a corrected re-submittal for one of the following reasons:

1) Submittal requires corrections, per comments, prior to final review.
2) Submittal data incomplete and requires more detailed information prior to final review.
3) Submittal data does not meet Subcontract document requirements.

(D) "Accepted for Use. Information Only Submittal." Submittals so dispositioned will generally be classified as Information Only for as-specified material and equipment.

Mandatory Approval coded vendor data will be reviewed by the Contractor and receive an A, B, or C disposition. Information Only submittals without comments will receive a D disposition. A, B, and C coded dispositioned submittals will be returned to the Subcontractor. D dispositioned submittals will not be returned to the Subcontractor. The Contractor may provide internal review of Information Only submittals. In the event that comments are generated on an Information Only submittal, the submittal may be dispositioned B or C and returned to the Subcontractor for appropriate action. Acknowledgment of receipt of dispositioned vendor data by the Subcontractor will not be required.

The Contractor will return dispositioned submittals with reasonable promptness. The Subcontractor shall note that a prompt review is dependent on timely and complete submittals in strict accordance with these instructions.

4.2 Design Calculations

Design calculations showing all loads specified shall be submitted. Design calculations shall include but not be limited to structural steel members and anchor assemblies. All calculations shall be stamped by a Professional Engineer registered in the State of Idaho to practice civil or structural engineering.

4.3 Peer Review of Design Calculations

An independent engineer shall submit a letter certifying that all aspects of the wind design have been peer reviewed and that resulting comments have been satisfactorily resolved and incorporated into the design calculations. The review should include design philosophy, structural system, construction materials, design criteria used, and other factors pertinent to the seismic and wind load resistance capacity of the facility. The review need not provide a detailed

check but rather an overview to help identify oversights, errors, conceptual deficiencies, and other potential problems that might affect facility performance during wind loading. The peer review is to be performed by independent, qualified personnel. The peer reviewer must not be from the same company as the designer nor have been involved in the original design. Individuals performing peer reviews must be degreed civil/structural engineers with 5 or more years of experience in natural phenomena hazards evaluation.

4.4 Shop Drawings

Submit "D" size shop drawings on the building systems completely detailing all major trusses, purlin/girt locations, columns, membrane attachment details, door installation details, lightning protection air terminal sealing details, base connection details and anchor bolt plan, wall base conditions, and any other graphic information required to evaluate the complete structure including all dimensions. The shop drawings shall be stamped by a Professional Engineer registered in the State of Idaho to practice civil or structural engineering. This same engineer shall stamp the erection drawings described below.

Provide shop drawings for balanced entrance/exit doors and roll-up doors showing plans, elevations, sections, details, and attachments to other work.

Provide shop drawings for the penthouse louver, showing all details of construction, including mounting curb and structural supports.

4.5 Erection Drawings & Instructions

Submit an erection plan including erection drawings, instruction manuals showing complete erection layouts, details, installation instructions, and foundation attachment details. All drawings shall be stamped by a Professional Engineer registered in the State of Idaho to practice civil or structural engineering.

4.6 Construction Details

Provide construction details for balanced entrance/exit doors and roll-up doors showing material descriptions, including electrical components, dimensions of individual components and profiles, and finishes, and installation details.

4.7 Operating and Maintenance Manuals

Maintenance instructions and procedures shall be provided for the fabric covered structure in a manual.

Submit operation and maintenance manuals for rolling service doors and operators. O&M manuals for manufacturer's standard items shall, unless otherwise specified, be the standard publication issued for the product by the manufacturer.

4.8 Welding Package

Submit a weld package including, but not limited to the following:

1. Welding procedure specifications and procedure qualification records. These procedures shall be referenced on the shop drawings, and erection drawings as applicable.
2. Welding personnel qualification records.
3. Subcontractor's nondestructive examination procedures.
4. Subcontractor's nondestructive examination personnel qualification records.
5. Procedures for the handling, storage, and control of filler and backing materials.
6. Weld histories including reports of each inspection, examination and test.
7. Detailed weld repair procedures.
8. Weld repair reports including weld identification, welder identification number, test procedure, reason for rejection, number of repairs required, and documentation that weld is repaired and accepted.
9. Shop drawings showing all welds. All necessary information such as location, size, weld preparation, etc., shall be shown. The drawings shall differentiate between shop and field welds. The weld procedures and filler material to be used shall be indicated.

4.9 Warranties

A manufacturer's warranty for not less than 5 years shall be submitted for the cladding fabric. A warranty for not less than 2 years for the fabric service doors shall be submitted.

Provide warranties for the balanced entrance/exit doors and roll-up doors as specified in the Accessory Systems section of these specifications.

Provide roll-up door warranties:

1. General: Warranty roll-up door work meeting provisions of Conditions of the Contract, except warranty shall include additional requirements specified in this Article.
2. Coverage: Warranty shall be signed by Contractor, installer, and manufacturer.
3. Time Period: Entire door for 2 years – Warranty time period for motor and gear box shall be 5 years.

Provide standard manufacturer's warranty on penthouse assembly.

5. DESIGN

5.1 General

This work includes the design of a complete re-locatable, prefabricated tension membrane (fabric) structure. The structural membrane shall be tensioned over the framework. The building footprint shall be rectangular to fit a steel floor structure as shown on attached drawings. The side and gable walls of the structures shall be vertical. The interior of the structure shall provide clear space as shown on the drawings and shall provide unobstructed floor space.

Sidewall balanced entry/exit doors and vertical fabric rollup door openings shall be provided with snow slide canopies to protect personnel and deflect the snow away from foot and vehicular traffic.

The structure shall include all accessories and items required and necessary to meet the scope, intended use, and function as specified. The building shall be insulated and allow natural light to enter to the building interior through the fabric/insulation system.

5.2 Performance Requirements

5.2.1 General

The structure shall be designed in accordance with recognized building code standards using methodology from the International Building Code (IBC). Primary and secondary framing shall comply with current issues of AISC, AISI, NEMA and ASTM specifications, as applicable. Structural members shall not be designed in excess of their allowable stress limits (allowable stress design) or the limit state stress (Load Resistance Factor Design) for the design loads given below. Appropriate safety factors to yield and ultimate must be maintained. Wind load factors and coefficients used in design of the structural members must be in accordance with IBC (ASCE 7-98) guidelines.

5.2.2 Roof Loads

At a minimum, the structure shall be capable of supporting a roof live load of 20 pounds per square foot projected over the entire roof area or a portion of the roof area, and any probable arrangement of loading resulting in the highest stress in the members.

5.2.3 Wind Loads

The structure shall be capable of withstanding steady wind loads from any direction of 90 miles per hour. The structure shall be designed using an exposure category "C" and importance factor of 1.15 for determining design wind pressure of the structure. The methodology is to be taken from the IBC (ASCE 7-98). Properly conducted wind tunnel tests may be used for the determination of wind loads as specified by ASCE 7-98. However, in no event shall the wind load used in the design of the main wind force resisting system be less than 10 lb/ft^2 multiplied by the area of the building or structure projected on a vertical plane that is normal to the wind direction.

5.2.4 Snow

The structure shall be capable of withstanding a snow load calculated in accordance with the IBC (ASCE 7-98) using a ground snow load of 35 lb/ft^2 and an Importance Factor of 1.2, or 30 lb/ft^2, whichever is greater.

5.2.5 Rainfall

The structure shall be capable of withstanding the effects of rainfall up to 1.6 in. per hour for at least 2 hours.

5.2.6 Seismic

Seismic loads shall be determined and applied in accordance with the IBC with parameters as follows: S_s period acceleration = 0.357g, 1-sec acceleration, S_1 = 0.131g, Site Class C, Seismic Importance Factor = 1.5 for structures and components, and Seismic Use Group III.

5.2.7 Fire Protection Seismic Loads

Coordinate fire protection static and dynamic loads imposed by sprinkler system and include such loads in design calculations to assure building structure is capable of supporting all loads. A schematic layout of fire protection piping is shown on the attached drawings.

5.2.8 Collateral Loads

The structure shall be capable of supporting all additional dead loads, other than the weight of the building system, such as fire sprinklers, mechanical HVAC systems, and electrical systems at a minimum collateral loading of 10 lb/ft^2. Schematic drawings showing all described dead loads mentioned above are attached to this specification.

5.2.9 Perimeter Duct and Cable Tray Loads

The WES structure shall be designed to support a 100 lb/ft load around the interior perimeter. The load will be due to utilities including electrical conduits and electrical cable tray. The conduits and cable tray are required to be supported at intervals not to exceed 10 ft on center. Provide intermediate structural supports and braces as necessary to meet this requirement. See reference drawings for suggested configuration of cable tray and conduit supports and braces, and for height requirements of supports and braces.

5.2.10 Ventilation Loads

The WES shall be designed to withstand a sustained operation pressure of -0.1 in. water gauge. Consider the ventilation load as a dead load for load case combinations.

5.2.11 Deflection

The maximum allowable deflection of structural members shall not be more than 1/180 of the clear span of that member when subjected to the design loads described herein.

5.2.12 Design Loads

The design shall be based on load cases as required by the latest issue of the IBC.

5.2.13 Foundation Design

The building manufacturer shall provide the Contractor with a copy of the foundation requirements, anchor bolt plan, truss, leg truss line locations, and reactions. The anchor bolt plan shall show the anchor bolt(s), material, number, size, location, projection, and spacing. Design of the foundation for the building (by others) shall be based on the maximum column/truss reactions as determined and provided by the building manufacturer.

The building shall be attached to the steel floor structure shown on the attached drawings.

5.2.14 Dimensions and Layout

The structure shall have the following exterior dimensions:

Overall width (minimum):	80 ft
Overall length (minimum):	110 ft
Clear inside height (minimum):	29 ft
Peak height:	as required (37 ft maximum)

5.2.15 Structural Frame

1. Roof and Wall Surfaces: The structure shall be designed such that roof and vertical sidewall surfaces form flat planes such that the building is compatible with standard door, window and ventilation systems.

2. Purlin Spacing: To provide for structural stability, to minimize unsupported areas of membrane fabric in the roof, and to provide for installation of accessory items, the main structural trusses shall be laterally braced by tubular purlins at intervals not to exceed 7 ft over the entire arch span.

3. Wind and Frame Bracing: The structure shall be appropriately stabilized with main wind bracing cable or rod assemblies as well as any required secondary node restraint assemblies so as to efficiently transfer wind, snow, and seismic induced stresses to the foundation/anchoring system. Cable diameter for main wind bracing shall be a minimum of 3/8-in. diameter and larger if so required. The end bays of the structure shall be "X"-braced as early as possible during the installation process to provide permanent stability. The structural frame shall be provided with engineered attachment clips or lugs for all main cable assemblies. These clips shall be minimum 3/8-in. thick A36 steel and shall be designed to properly transfer wind forces within the structural frame. It should be noted that bracing cables or rods extending beyond the fabric building perimeter shall not be allowed. All required bracing shall be contained within the perimeter of the steel support structure.

4. Connecting Joints: Connections between structural elements shall be properly designed with required safety factors so as to transfer the maximum compressive and tensile forces present in a given joint.

5. Mechanical Equipment Interface: The main structural roof trusses shall allow for installation of electrical and mechanical equipment within the depth of truss members unless this depth is confined between the inner cladding/insulation and outer skin surfaces of the wall and roof assembly. No other materials shall be allowed to be placed within the insulation membrane cavity. Likewise, the structure shall accept penetrations through the membrane assembly for access doors, mechanical services, and electrical services with minimal modification.

6. Ancillary Systems: The structure shall be designed such that it can accommodate an insulation system, lighting, sprinklers, and heater installation as specified herein and shown on the drawings.

5.2.16 Membrane Cladding System

1. Continuous Weather Tight Membrane: The structure's membrane shall form a continuous, uninterrupted weather-tight shell over the framework. In order to provide for a good finished appearance and to ensure weather tightness, the gable wall cladding shall be manufactured so as to be connected in one piece to the adjacent sidewall and roof cladding without the use of caternary cables. Wall to roof fabric panels shall be glued together to maximize air tightness.

2. Liner Membrane. A liner membrane shall be provided to on the interior of the WES to enclose building insulation and make decontamination operations simpler. The membrane may be attached to the inside cord of the building trusses or at another location. Exposure of the trusses within the building is acceptable. All liner support materials must be of noncombustible construction.

3. Cladding Section Joints: Adjacent cladding sections shall be provided either with a mechanical tensioning system or shall lace together with a minimum 1/4-in. white polyester braided rope so as to maintain cladding tension along the length of the building. Proper gaps shall be maintained between sections so as to allow sufficient distance to enable full tensioning of the material.

4. Overlap Seams: The membrane system cladding panels shall be supplied with overlap joints to allow adjacent panels to be field heat sealed together.

5. Base Tensioning System: The cladding shall be provided with a mechanical tensioning system that allows the cladding to be fully tensioned around the structure perimeter. The system shall be designed such that the membrane can be tightly and neatly secured over the structural frame and such that the system has remaining range of adjustment. Cables used to tension cladding shall not extend beyond the steel platform providing support for the WES.

6. Membrane Seal at Openings and Base: The structure supplier will provide all materials and methods necessary to fully tension and seal the membrane material around all door, ventilation, and other openings as well as around the structure perimeter below the main tensioning system. This seal shall provide a neat and finished appearance and eliminate any loose cladding that could otherwise be damaged by flapping or abrasion. A base skirt shall be provided and attached at the base perimeter so as to allow a reasonable seal against air and water intrusion.

7. Design Safety Factor: The attachment and tensioning system shall be designed such that the complete system allows a factor of safety at design loads of at least three times the theoretical design strength of the cladding material. The structure's membrane shall

not be designed to function as a structural member such that, should any damage to the membrane occur, the integrity of the structural framework shall not be affected.

5.2.17 Operation and Use

The structure shall be designed to provide a minimum 2-year operational use period. The structure shall be capable of being assembled, operated and dismantled in all ambient temperatures between –20°F and 120°F. The fabric material shall be designated to withstand a maximum temperature of 150°F when stored in packing containers. The structure shall be designed such that a crew of five persons working with a trained supervisor can unpack and assemble the structure at a rate of approximately 1,750 ft^2/day (25 ft^2 per person hour) on a prepared surface. A similar crew shall accomplish disassembly at a rate of 2,000 ft^2/day. The structure shall be capable of accepting differential settlement up to 1% between truss positions.

5.2.18 Lightning Protection

The structure shall be designed to accommodate installation of a lightning protection system by others. Base plates will be attached to the trusses at the ridgeline. 24-in. x 5/8-in. diameter air terminals will penetrate the fabric. Provisions shall be made to seal around the penetrations. The trusses shall be electrically continuous from the ridgeline to the point of connection at the floor.

6. MANUFACTURING AND ASSEMBLY

6.1 General

All materials used in the structure shall be new, without defects, and free of repairs. The quality of the materials used shall be such that the structure is in conformance to the performance requirements specified herein.

6.2 Material

6.2.1 Cladding/Liner Membrane

The structure shall be clad outside and inside with a coated polyester fabric manufactured by an approved supplier. Acceptable membrane suppliers include: Seaman, Ferrari, Protan and Heytex. The membrane fabric shall be waterproof, weatherproof, and free from defects. All roofs, walls, end walls, and connecting sections shall be weathertight and watertight. The material will be translucent white for the sidewalls and roof. The material must be UV stabilized and flame retardant and must carry a minimum 5-year manufacturer's warranty. The minimum fabric specification is as follows:

Coated Weight:	24 oz/yd^2	(Method 5401)
Base Fabric Weight:	5 oz/yd^2	
Grab Tensile Strength, lb:	375/350	(Method 5100)
Trapezoidal Tear, lb:	50/60	(Method 5136)
Cold Crack Resistance:	-40°F	
Flame Spread Rating:	25 Maximum	(ASTM E-84)
Smoke Developed Rating:	450 Maximum	(ASTM E-84)

6.2.2 Metal

All components of the structure framework shall be fabricated from steel. The primary material used in the structural arches shall be steel conforming to ASTM A36 or better specification. Flat bar and other shapes shall, at a minimum, be A36. All steel components shall be either galvanized, zinc plated or painted.

6.2.3 Fasteners

Fasteners subject to extreme stress and wear shall be structural bolts conforming to ASTM A325. Anchor bolts shall conform to ASTM A36, A307, or A687. All other structural fasteners shall be of Grade 2 or higher. Other nonstructural fasteners such as wood screws, tek screws, etc., shall be of standard commercial quality. All fasteners shall be plated. All high strength bolting (A325) shall be installed in accordance with the latest edition of the AISC Steel

Specifications. Fasteners subject to removal or adjustment shall not be installed by force such as swaging, peening, or staking.

6.2.4 Membrane Tensioning Hardware

The fabric membrane shall be tensioned with load-rated hardware which is hot-dip galvanized so as to prevent corrosion. Tensioning hardware shall allow for full and free rotation at the foundation connection so as to avoid fatigue failure of threaded assemblies.

6.2.5 Exterior Trim

Battens or washers used for final seal of the membrane shall be either hot-dip galvanized, stainless steel or aluminum to resist corrosion. Fasteners used for exterior trim work shall be stainless steel; zinc-plated or hot-dip galvanized.

6.2.6 Welding

Welding shall be utilized only when specified in the original design. Welding shall be performed in accordance with AWS D1.1.

6.2.7 Workmanship

The workmanship of all materials and components of the structure shall be of commercial standard quality commensurate with the functional requirements of the item. Welded joints shall be as such that grinding of the finished welds is unnecessary. Welds shall have thorough penetration, good fusion, and shall be free from scabs, blisters, abnormal pockmarks, cracks, voids, scab inclusion, and other defects. Coated fabric shall be free of pinholes, thin or weak areas caused by abrasion, exposed fabric, blisters, tunnels, creases, wrinkles, delamination of coating, or places where coating is missing.

6.3 Accessory Systems

6.3.1 Building Signage (Letters)

Building signage will be provided by others.

6.3.2 Lifting Kit

Provide continuous, hot-dip galvanized, steel wide-flange foundation beam to evenly distribute forces when lifted. Provide lifting lugs welded to the top cord of the truss along with reinforcement plates. Provide pre-loaded lifting cables with swaged finished ends, shackles, and "D" rings.

6.3.3 Insulation

Provide an insulation system that will result in a minimum wall and ceiling insulating value of R-14 roof and R-10 walls. Insulation shall have a maximum flame spread rating of 25 and a smoke developed rating of 50.

6.3.4 Balanced Entry/Exit Doors

Provide personnel doors in sizes and types as shown on the drawings and as specified herein.

Provide all hardware, glazing, and all necessary framework, trim, and supports to install complete. The doors shall seal tightly to the building wall, frame, and threshold to maintain a negative air pressure inside the building.

Personnel Doors: Provide galvanized steel doors and frames of 16-gage face sheets and welded corner hollow metal frames. Doors shall be hinged near the center to allow entrance and exit while negative internal air pressure is maintained within the structure. Tops and bottoms of doors shall be flat and smooth except where the concealed closer arm is mounted on top of the door. There will be no visible seams showing on the doors. All seams shall be welded and ground smooth. Doors and frames shall be factory painted with enamel paint of color as selected by the BBWI architectural design organization. Door shall be foam filled to achieve an R value of "5" minimum per square foot.

Provide doors with an insulated vision lite. Glazing shall be held in place by a painted hollow metal stop frame. Glazing shall be double pane, 1/4-in. clear tempered float glass or laminated safety glass panes, unit shall be 1 in. minimum thickness.

Door hardware:

Hinges: none
Closer: Rixson 608 center pivot concealed type with bottom pivot included.
Weather stripping: Pemko 290 AS
Door bottom sweep: Pemko 368 pm both sides of door
Threshold: Pemko 172A
Exit Device: Sargent 8804 FLW 630 x 1E72 626.

6.3.5 Vertical Fabric Roll-up Doors

Provide vertical fabric, electric operation roll-up doors as indicated on the drawings and in the specifications.

The roll-up doors include operating roll-up door assemblies, including hardware, operators and installation accessories, to suit door openings and operation.

Doors shall be electrically powered, fabric, roll-up doors as manufactured by DYNACO USA, model #P.M3, or approved equal.

Design criteria for the roll-up doors is as follows:

1. Design Conditions: Design of work shall include live loads, wind loads, deflections, temperature variations, stresses, expansion and contraction requirements, seismic forces and other like loads and conditions as specified elsewhere in this specification.
2. Loading: Work shall withstand a minimum uniform loading pressure, both positive (acting inward) and negative (acting outward), acting normal to plane and over gross area of door, of uniform static air pressure meeting requirements of ASTM E330, of 20 lb/ft^2.
3. Exterior Doors: These doors are exterior type.
4. Clear Open Position: When door is in full open position, entire door, including any appurtenances, shall clear jambs and head of door opening. In addition, vertical operating doors shall be of such a design that all of the components of the door blade area above the top of the opening's lintel when the door is in the full open position.
5. Operating Conditions: For interior or exterior environments. Able to handle a wind load of 90 mph without the use of any wind bars either pressing against the fabric or attached onto the fabric. Also the door shall be able to handle these conditions without the use of a solid bottom beam.
6. Operational Speed: Minimum opening and closing speed: 6-in. per second. Gear driven, without ballast.
7. Side frames to be made of structural U channels of 3-1/8 x 1-5/8 x 1/8-in. steel, galvanized before cutting and folding. The side guides shall be mounted in the side frames, and made of polyethylene (PE-UHMW 1000) attached to tensioning springs.
8. Door to be such a design that not more than 2 cfm amount of air can pass through the door when it's in the fully closed position.
9. Door curtain fabric to be on a minimum weight of 26 $ounces/yd^2$.
10. Door curtain shall be equipped with a SAFE EDGE™ bottom detector along the full width of the door. This detector will sense the impact with an object and will automatically reverse the direction in which the door is moving. Total downward force of a closing door shall not exceed 20 lb.
11. Reversing infrared photocell with a transmitter and receiver to be provided and located within the door side frame.

12. Self Repair Feature: Must release fabric door immediately upon impact from side guides without tearing the fabric. Activation of the FIX ITSELF™ system shall not cause the door to stop. Door will continue in the direction it was moving unless the infrared eye or the SAFE EDGE™ system has been activated; only then will the door stop and reverse its direction. Upon activation, the door curtain will automatically reinsert itself into the side guides. Cover for side frames shall remain in place at all times. Doors which require the side covered to be unfastened and opened to reset a breakaway feature are not acceptable. FIX ITSELF™ feature must be totally self-repairing in all stages of the door's opening and closing cycle.
13. Door Actuation: A single push button to open the door should be mounted on a control box cover located at interior side of the door and one additional remote three-push button station located at exterior side of door, and loop detector with time delay close.

Electrical design criteria for the roll-up doors is as follows:

1. General: Provide doors with associated electrical motors, control devices, enclosures and like equipment and devices as required meeting applicable requirements of NFPA 70 and NEMA standards for type, enclosure, function and like characteristics relative to operation, location, and environment of door. All electrical equipment shall be UL listed and labeled.
2. Available Electrical Power:

   General: Coordinate current characteristics and wiring requirements with electrical system of building.

   Operators: Shall be supplied with a 460-volt, three-phase, 60-Hertz power feed.
3. Components: Electrical components shall be UL and FMRC labeled. Control devices shall be of a design suitable for a commercial exterior application. Automatic controls shall be complete with step-down transformers. Electrical components shall be factory wired where possible and ready for project site wiring.
4. Motors: Provide normal starting torque, reversible constant duty, Class A insulated electric motors of 1/2-hp minimum and with electromagnetic starter with thermal overload protection and lockout capabilities. Motor type shall be totally enclosed fan cooled (TEFC).
5. Enclosures: Controllers, control devices, and like items shall have NEMA Type 3R enclosure for exterior use and NEMA Type 12 for interior use.
6. Control Location: Provide electrical control devices for doors on side of adjacent spaces with warmest operating temperature, except for exterior doors or as otherwise required.

7. Operator shall consist of motor and logic system. Provide electric motor assembly of design, type, size and capacity as determined and furnished by door manufacturer for size, weight, performance function and other characteristics of the door. Operators using brakes and clutches to stop the door's motion are not allowed. Operator to be of such a design that a brake is not required to hold the curtain up in the open position. Operator to be controlled by a frequency inverter.
8. Electric control panel shall be fully assembled and ready for connection. All components and the layout of such components should be UL/CSA listed. Control panel face should contain a rotary disconnect switch, an emergency stop push button, and an open/close push button.

Deliver, store and handle door materials meeting instructions and recommendations of manufacturer. Deliver doors in an enclosed carton or crated to provide protection during shipment, handling, and storage. Door identification shall be marked on outside of each crate.

Furnish installation assistance services of an authorized and qualified factory mechanic of door manufacturer to give preparation, installation and adjustment instructions, assist in startup operations, direct acceptance inspections and tests, and perform like services at project site as necessary.

Furnish operating and maintenance data for roll-up doors and appurtenances. Include instructions for operations, adjustment, maintenance, including cleaning and repair, product data of manufacturer for each material and component, and schedules and parts lists. Also, include recommended cleaning agents and procedures.

Provide instructions and demonstrations to Contractor covering operation, adjustments, and maintenance of roll-up doors. Furnish services of an authorized and qualified representative of door manufacturer to provide instructions and demonstrations.

Accessories: Furnish any inserts and anchoring devices, which must be set in or embedded into supporting building construction for installation of roll-up doors. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices.

6.3.6 Penthouse Louver

An inlet air louvered penthouse shall be installed at the peak of the building, centered along the long axis. The penthouse shall be Greenheck Model WIH, 42 x 60-in. throat dimension. Penthouse shall feature a storm-resistant, 0.080-in. aluminum louver with mitered corners. Construction shall be all-aluminum. A birdscreen shall be installed with 1/2-in. mesh mounted across the intake openings. The penthouse shall be installed on the facility with all necessary roof curbs and sealing accessories to provide a leak-proof installation. A 16-gage galvanized steel duct shall be installed by the building manufacturer at the time of penthouse

installation, and shall extend from the penthouse throat into the facility at least 6 in. beyond the inner liner membrane for later connection of ductwork by others. The building manufacturer shall provide necessary structural support for the penthouse and 200 lb of additional ductwork and equipment to be installed by others. A tight seal around the roof curb and liner panel shall be provided to prevent water penetration and minimize air leakage into the building.

7. QUALITY ASSURANCE

American Society of Mechanical Engineers (ASME) NQA-1-1997 is applicable to the scope of work identified in this document. An acceptable equivalent to ASME NQA-1-1997 is a Quality Assurance system implemented and maintained in accordance with International Organization for Standards (ISO) 9001 or American National Standards Institute Q9001, Quality Systems-Model for Quality Assurance in Design Development, Production, Installation, and Servicing. Specific criteria for implementation are listed in the ASME NQA-1 Applicability Matrix, appended to final contract.

Visual examination will be performed for workmanship and of all materials and components of the structure, as specified in this specification.

Visual examination of welding will be performed in accordance with AWS D 1.1.

Regulatory Requirements (Codes and Standards): Comply with provisions of the following codes and standards, unless otherwise specified:

Structural Steel
AISC (ASD)

Design
International Building Code (seismic, wind, and snow loading)

8. EXECUTION

8.1 Installation

The building manufacturer will provide a full-time installation supervisor to oversee the erection of the fabric structure. The INEEL Site Stabilization Agreement requires site construction by workers supplied by local trade unions. Therefore the building erection will be by local union ironworkers or other union trades as appropriate.

8.2 Erection

Erect building and complete and in strict accordance with manufacturer's erection plan and installation instructions. Coordinate with Facility Floor Structure (FFS) to ensure proper fit.

9. PACKAGING AND SHIPPING

9.1 Piece Marking and Identification

All individual parts or bundles of packages of identical parts are to be clearly marked for identification or otherwise identified by clear installation procedures. Bolts and fasteners shall be packaged according to type, size, and length. Loose nuts and washers shall be packaged according to size and type. The shipping documents shall include a shipping list showing the description, quantity, and piece mark of the various parts, components, and elements.

9.2 Handling

At no time shall materials be dropped, thrown, or dragged over the transport equipment or the ground. Materials shall be protected at all times from standing water.

9.3 Material Delivery

The building system materials shall be delivered to the project site during normal working hours on weekdays. Unloading will be accomplished by others with union labor.

9.4 Material Storage

Materials stored at the INEEL site shall meet requirements of class "C" per STD 1132 and MCP-2464.

Performance Specification Environmental Restoration	**OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT** **Weather Enclosure Structure**	Identifier: Revision: Page:	SPC-364 0 A1 of A2

APPENDIX A

Vendor Data Schedule

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431.14
08/01/2001
Rev. 03

Vendor Data Schedule

Project Title OU 7-10 Glovebox Excavator Method Project Weather Enclosure Structure

Purchase Order/ Work Order/ Subcontract No. 021052

System Engineer/ Project Manager JENSEN SCOTT A **Date:** 08-APR-02

Rev: 0

Vendor Data Coordinator Address POOLE M ANNETTE, TSB-1WI404, MS: 3915

Vendor Data Codes

A. As-Built Drawings B. Assembly Drawings C. Attendance Record D. Blasting Plan E. Catalog Data F. Chem & Physical Analysis G. Concrete Mix Design H. Control System Diagram I. Design Calculations J. Installation Instructions	K. Manufacturers Data Report L. O&M Manual M. Parts List N. Piping Drawing O. Procedure/Instructions P. Pump Head Curves Q. Personnel Qualifications R. Red_line Drawings S. RSMI & Maintenance Log T. Sample(Color, Texture, etc.)	U. Shop Drawings V. Survey Records W. Test Procedure X. Special Processes Y. Operational/CC Testing Z. Test Reports AA. UL/FM Listing AB. Warranty/Guarantee AC. Weld Records AD. Wiring Diagrams	AE. MSDS AF. Hardware Schedule AG. Specification AH. Manufacturing/Inspection/Test Plan AI. Test Certification AJ. Recommended Spares AK. Special Tools List AL. Certificate of Conformance AM. Certificate of Disposal or Destruction AN. Design Verification	AO. Design Qualification Testing AP. Traceability Procedure AQ. Cleaning Procedure AR. Weld Procedure Qualificaiton AS. Welder Performance Personnel Qualifications AT. Non-Destructive Examination Personnel Certifications AU. Inspector Certifications AV. Limited Shelf Life/Operational Data AW. Special Packaging, Shipping, and Rigging Procedure AX. Certificate of Materials to ASME Code AY. Chemical Inventory AZ. Other

When to Submit

AC - As Completed AT - After Test BC - Before Contract Awarded	BFA - Before Final Acceptance BFR - Before Fabrication Release ROS - Removed Off-Site PDS - Prior to Delivery on site	PTP - Prior to Purchase PS - Prior to Shipment PT - Prior to Test	PTC - Prior to Construction Start PTI - Prior to Installation PTW - Prior to Welding	TS - Time of Shipment WP - With Proposal

Item No.	Clause/Article or Drawing/Specification Reference	Description	Vendor Data Code	Extra Copies Required	When to Submit	Approval Code
1	2.	Manufacturer and Supervisor records of experience	Q. Personnel Qualifications		BC - Before Contract Awarded	Approval Required
2	5.2.16	Preliminary fabric sealing and fabric connection details	AZ. Other		BC - Before Contract Awarded	Approval Required
3	Subcontract	Material safety data sheets	AE. MSDS	0	PS - Prior to Shipment	Approval Required
4	3.1 and 5.2.15	Certificate of conformance for structural framing	AL. Certificate of Conformance		PS - Prior to Shipment	Approval Required
5	4.2	Design Calculations	I. Design Calculations		BFR - Before Fabrication Release	Approval Required
6	4.3	Letter certifying peer review of design calculations	AN. Design Verification		BFR - Before Fabrication Release	Information Only

7	4.4	Shop drawings building systems	U. Shop Drawings	2	BFR - Before Fabrication Release	Approval Required
8	4.4	Penthouse Louver	U. Shop Drawings		PS - Prior to Shipment	Information Only
9	4.4	Balanced Doors and Roll-up Doors	U. Shop Drawings		PS - Prior to Shipment	Information Only
10	4.5	Erection drawings	B. Assembly Drawings	2	PS - Prior to Shipment	Approval Required
11	4.5	Erection instructions	J. Installation Instructions	2	PS - Prior to Shipment	Approval Required
12	4.6	Construction/design details	U. Shop Drawings		PS - Prior to Shipment	Information Only
13	4.7	Maintenance Manuals building assembly fabric	L. O&M Manual		BFA - Before Final Acceptance	Approval Required
14	4.7	Roll-up Door and Operators	L. O&M Manual		BFA - Before Final Acceptance	Information Only
15	4.8	Building fabric certification of conformance to specification requirements.	AL. Certificate of Conformance		PS - Prior to Shipment	Approval Required
16	4.8	Weld Package including quals, procedures, shop drawings etc.	AC. Weld Records		PTW - Prior to Welding	Approval Required
17	4.9	Building Fabric Cladding	AB. Warranty/Guarantee		BFA - Before Final Acceptance	Approval Required
18	4.9	Warranty on penthouse assembly	AB. Warranty/Guarantee	0	PS - Prior to Shipment	Approval Required
19	4.9	Warranty on roll-up door including motor and gear box	AB. Warranty/Guarantee		BFA - Before Final Acceptance	Approval Required
20	4.9	Warranty for balanced entrance/exit doors	AB. Warranty/Guarantee		PS - Prior to Shipment	Approval Required

Instructions:

1. Refer to subcontract documents for instructions on submittals.
2. Electronic submittals in lieu of paper documents are acceptable and encouraged.
3. The normal number of copies required is ONE. If more are required, the number will be shown here.
4. THE INEEL WILL SCAN ALL SUBMITTED VENDOR DATA INTO A SYSTEM THAT IS ACCESSIBLE TO ALL INEEL EMPLOYEES UNLESS THE SUPPLIER/SUBCONTRACTOR IDENTIFIES SUBMITTED INFORMATION AS PROPRIETARY.

Appendix B

Drawings

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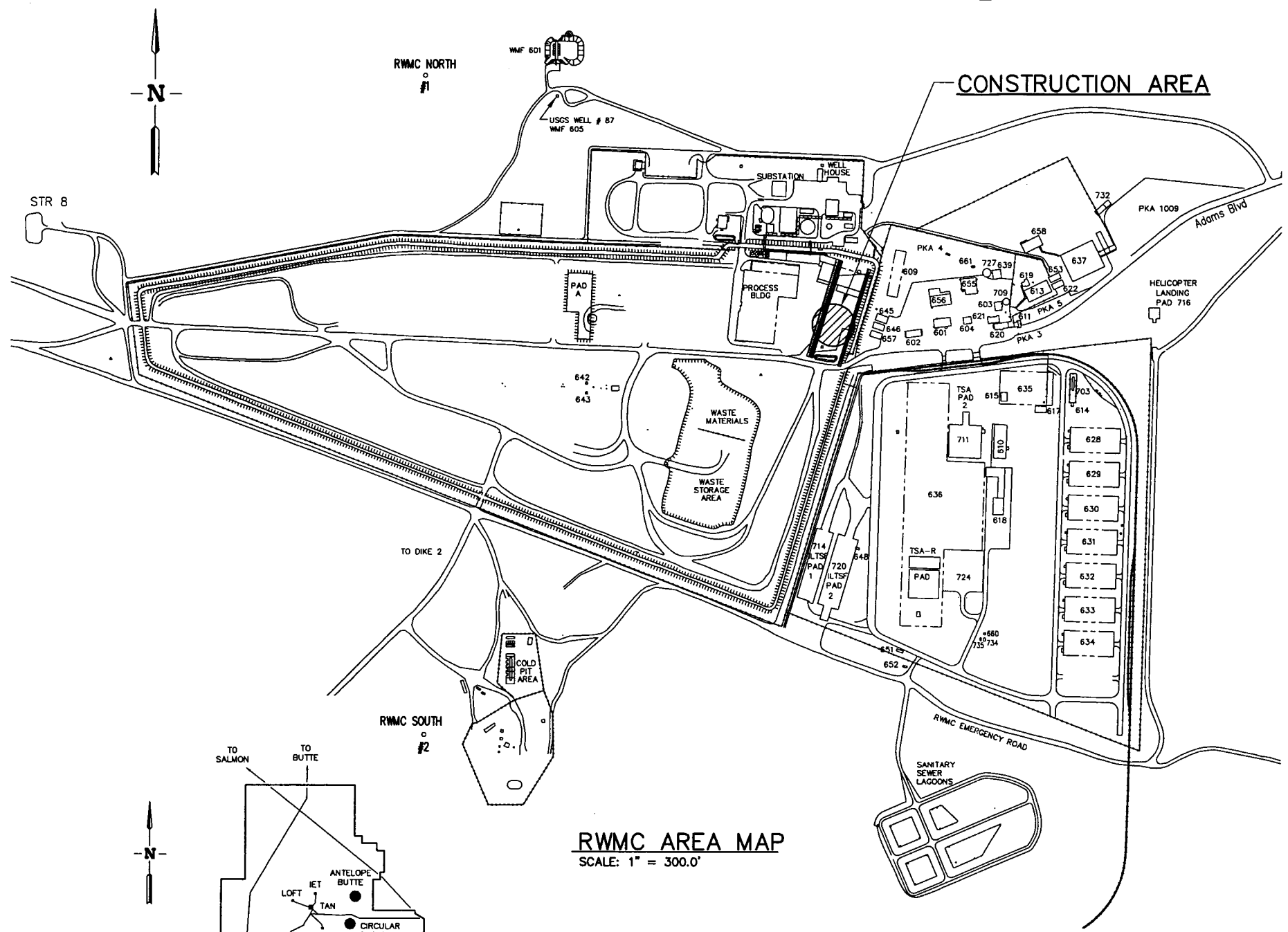
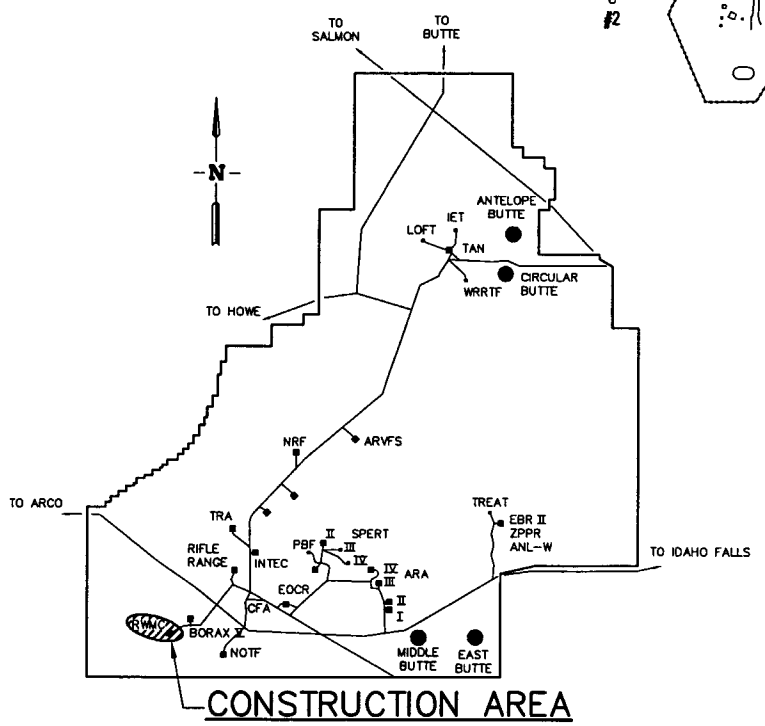


RWMC AREA MAP
SCALE: 1" = 300.0'



SITE MAP
SCALE: NONE

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:

DRAWING INDEX

PAGE NO.	DWG NO.	A-E SH NO.	REV	DRAWING TITLE
TITLE SHEET				
1	519896	T-1		SITE MAP, AREA MAP AND DRAWING INDEX
ARCHITECTURAL				
2	519897	A-1		FLOOR PLAN
3	519898	A-2		ELEVATIONS
4	519899	A-3		ELEVATIONS
5	519900	A-4		SECTIONS
6	519901	A-5		DETAILS AND SECTION

X-REFERENCE DRAWINGS

519670	FFS XREF
519671-2	RCS STRUCTURE
519677	WES STRUCTURE
519861	SHORING BOX

INFORMATION ONLY DRAWINGS

519889	A-1	RCS FLOOR PLAN
519893	A-5	RCS VIEWS
519941	FP-1	FIRE PROTECTION LEGEND, ABBREVIATIONS AND ACRONYMS
519942	FP-3	WES FIRE PROTECTION ISOMETRIC
519943	FP-4	WES UPPER FIRE PROTECTION PLAN
519944	HV-3	FACILITY VENTILATION ISOMETRIC
519945	HV-4	FACILITY VENTILATION PLAN
519939	E-1	WES ELECTRICAL PLAN
519940	E-2	WES ELECTRICAL SECTION

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A
300' 200' 100' 0 300' SCALE: 1" = 300.0'	REQUESTER: SA DAVIES
	DESIGN: DN NISHIOKA
	DRAWN: B.SEARLE
	PROJECT NO. 021052
	SPEC CODE: REC REL
	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846
DESIGN PHASE: PERF SPEC	EFFECTIVE DATE:
SAFETY CATEGORY: LSC	SCALE: NOTED

INEEL — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE (WES)
SITE MAP, AREA MAP AND DRAWING INDEX

SIZE	CAGE CODE	INDEX CODE NUMBER: AREA	TYPE	SEQ.	SUBSEQ.	DWG-519896	REV
D	1MF3	098	0100	01	090		
						SHEET T-1	

PHT-01-REV 3.1
Layout Name: T-1
Date: 05/09/02 - 3:02 P.M.
ID: ABE
File: 519896.dwg
Path: V:\WES_PERF_SPEC

FMT-D1-REV 3.3

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:

110'-0"*

13'-6" | 16'-8" TYP BAY SPACING SEE NOTE 1 | 10'-0" | 16'-8" TYP BAY SPACING SEE NOTE 1 | 21'-0"

WEATHER ENCLOSURE STRUCTURE

BALANCED ENTRY/EXIT DOOR, SEE DETAIL 4

BALANCED ENTRY/EXIT DOOR, SEE DETAIL 4

80'-0"*

APPROXIMATE LOCATION OF TEMPORARY CONSTRUCTION OPENING IN "WES"

RCS FACILITY, REF

PIT AREA, REF

BALANCED ENTRY/EXIT DOOR, SEE DETAIL 4

21'-0"

FABRIC CORRIDOR, 14'-0" X 12'-0" CENTERED ON OPENING AT OVERHEAD DOOR

FABRIC CORRIDOR, 6'-0" X 8'-0" CENTERED ON OPENING AT PERSONNEL DOOR

BALANCED ENTRY/EXIT DOOR, SEE DETAIL 4

1'-6" x 1'-6", LOUVERED EXCAVATOR EXHAUST DAMPER, MOTOR MOUNTED INSIDE BLDG BETWEEN TRUSSES AT 12'-0" ABOVE TOP OF STEEL, SEE NOTE 2

12' x 10' FABRIC VERTICAL ROLL-UP DOOR

B / A-4

12' x 16' FABRIC VERTICAL ROLL-UP DOOR

TBD

BALANCED ENTRY/EXIT DOOR, SEE DETAIL 4

2"ø PIPE PENETRATION, 4'-0" ABOVE TOP OF STEEL

2'-6"ø DUCT PENETRATION, 13'-2 ABOVE TOP OF STEEL

29'-10"

41'-4"

67'-0"

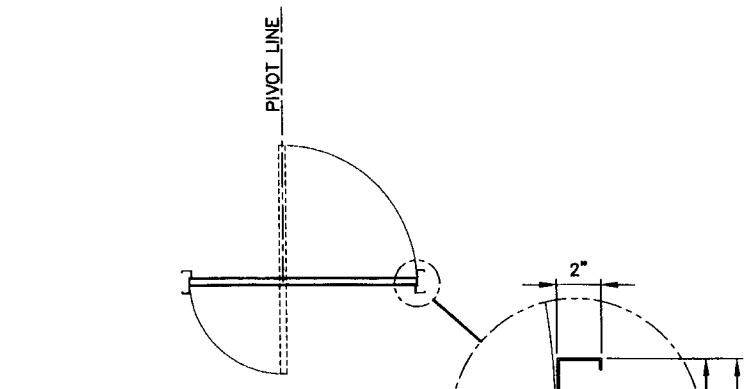
80'-0"

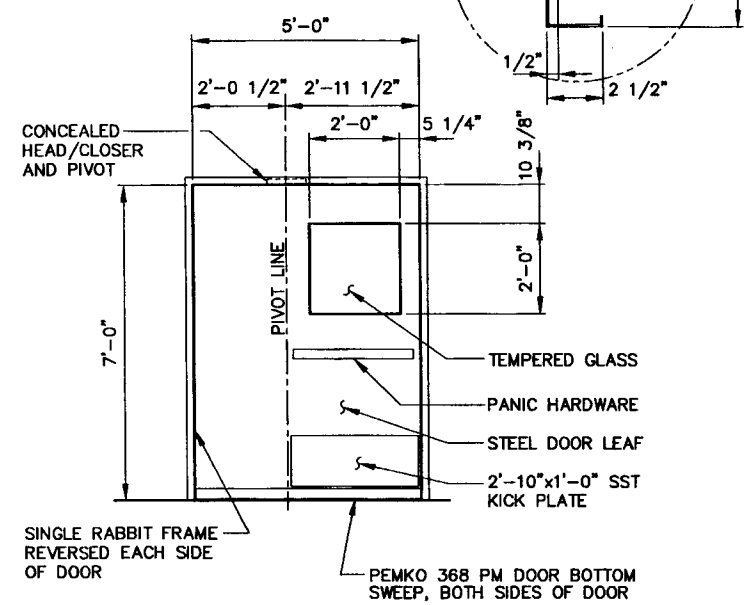
PLAN

SCALE: 3/16" = 1'-0"

LEGEND

* – OVERALL DIMENSIONS ARE OUTSIDE TO OUTSIDE OF WEATHER ENCLOSURE FRAMING





TYPICAL INSIDE ELEVATION OF BALANCED DOOR ASSEMBLY

DETAIL 4

SCALE: 1/2" = 1'-0"

NOTES

1. END BAY SIZES SHALL BE DETERMINED BY BLDG MFR.
2. TOP OF STEEL ELEVATION IS BASED FROM THE TOP SURFACE OF THE PERIMETER W24x94 OF THE FACILITY FLOOR STRUCTURE FRAMING.

X-REF DRAWINGS

519670
519671-2
519677
519861

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REGISTERED PROFESSIONAL ENGINEER 8008 STATE OF IDAHO SCOTT ALAN JENSEN 5/10/02

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REQUESTER: SA DAVIES	
DESIGN: DN NISHIOKA	
DRAWN: B.SEARLE	
PROJECT NO.	021052
SPEC CODE	REC REL
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO.	90846
EFFECTIVE DATE:	5/10/02
DESIGN PHASE: PERF SPEC	
SAFETY CATEGORY: LSC	

SCALE: 3/16" = 1'-0"

SCALE: 1/2" = 1'-0"

INEEL — Idaho National Engineering & Environmental Laboratory — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE (WES)

FLOOR PLAN

SIZE	CAGE CODE	INDEX CODE NUMBER AREA	TYPE	DL	ORG.	DWG-	REV
D	01MF3	098	0671	00	090	519897	

SCALE: NOTED — SHEET A-1

Layout Name: A-1 floorplan | ID: ABE
Date: 05/09/02 – 1:10 P.M.
File: 519897.dwg
Path: V:\WES_PERF_SPEC

AVT-01-REV 3.3

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:

AIR INTAKE VENTILATOR, SEE SPECIFICATIONS

ROOF CURB BY BLDG MFR

SLIDE PROTECTION OVER ALL DOORWAYS AT SIDE WALLS, TYP

ACCOMMODATE 2'-6"ø DUCT, AND SEAL

ACCOMMODATE 2"ø BREATHING AIR PIPE, AND SEAL

ACCOMMODATE 2"ø PLANT AIR PIPE, AND SEAL

16'-2"

4'-1"

8'-1"

10'-1"

13'-9"

EXISTING FLOOR STRUCTURE

1'-6" x 1'-6", 12'-0" AFF, LOUVERED EXCAVATOR EXHAUST DAMPER, MOTOR MOUNTED INSIDE BLDG BETWEEN TRUSSES

WEST ELEVATION

AIR INTAKE VENTILATOR, SEE SPECIFICATIONS

ROOF CURB BY BLDG MFR

SLIDE PROTECTION OVER ALL DOORWAYS AT SIDE WALLS, TYP

EXISTING FLOOR STRUCTURE

EAST ELEVATION

X-REF DRAWINGS

519670
519677

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

REGISTERED PROFESSIONAL ENGINEER 8894 STATE OF IDAHO SCOTT ALAN JENSEN 5/10/02

FOR DRAWING INDEX SEE DRAWING NO.	519896
SCALE: 3/16" = 1'-0"	0 1 2 3 4 5 10'
DESIGN PHASE:	PERF SPEC
SAFETY CATEGORY:	LSC
SUBCONTRACT NO.	N/A
REQUESTER:	SA DAVIES
DESIGN:	DN NISHIOKA
DRAWN:	B.SEARLE
PROJECT NO.	021052
SPEC CODE	REC REL
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO.	90846
EFFECTIVE DATE:	5/10/02

INEEL — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE (WES)

ELEVATIONS

SIZE	CAGE CODE	INDEX CODE NUMBER: AREA	TYPE	SEQ	SBS	DWG-	REV
D	01MF3	098	0671	00	090	519898	

SCALE: 3/16" = 1'-0" SHEET A-2

Layout Name: A-2 ELEVATIONS | ID: ABE
Date: 05/09/02 - 1:22 P.M.

File: 519898.dwg
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FMT-01-REV 3.3

REVISIONS		
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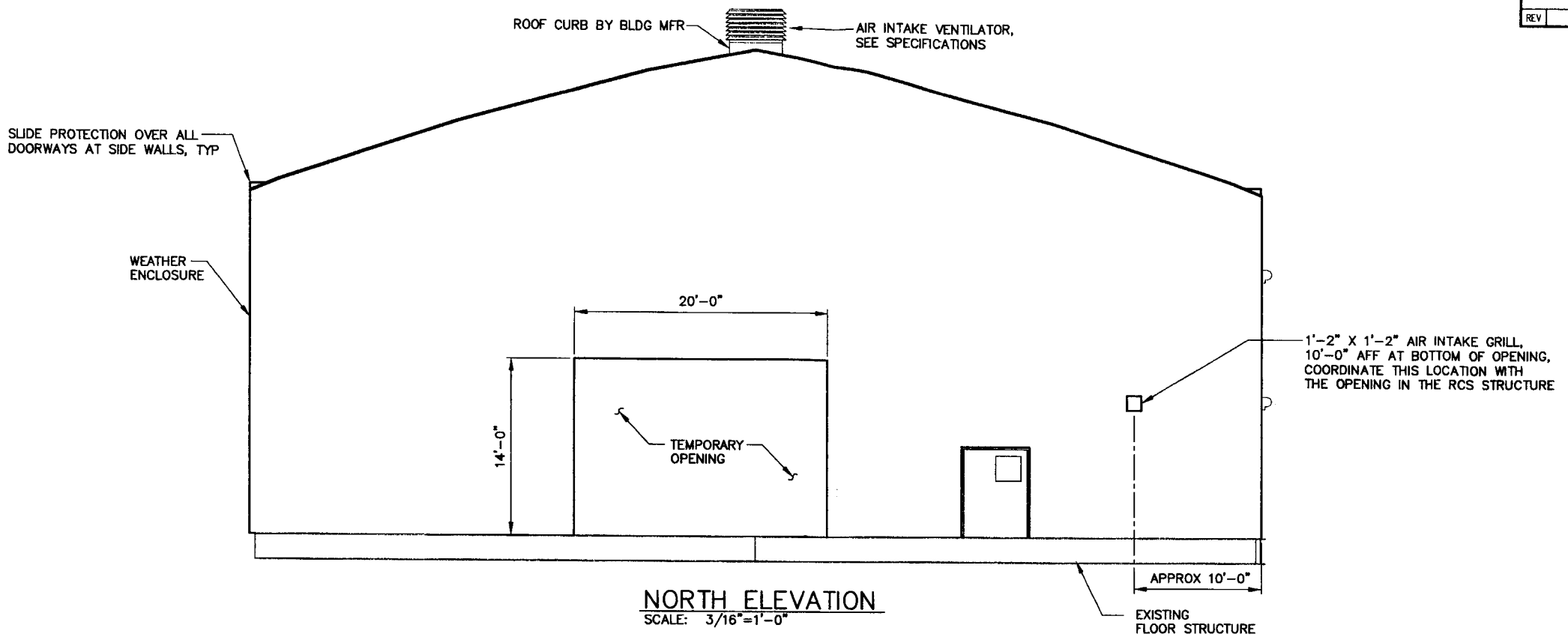
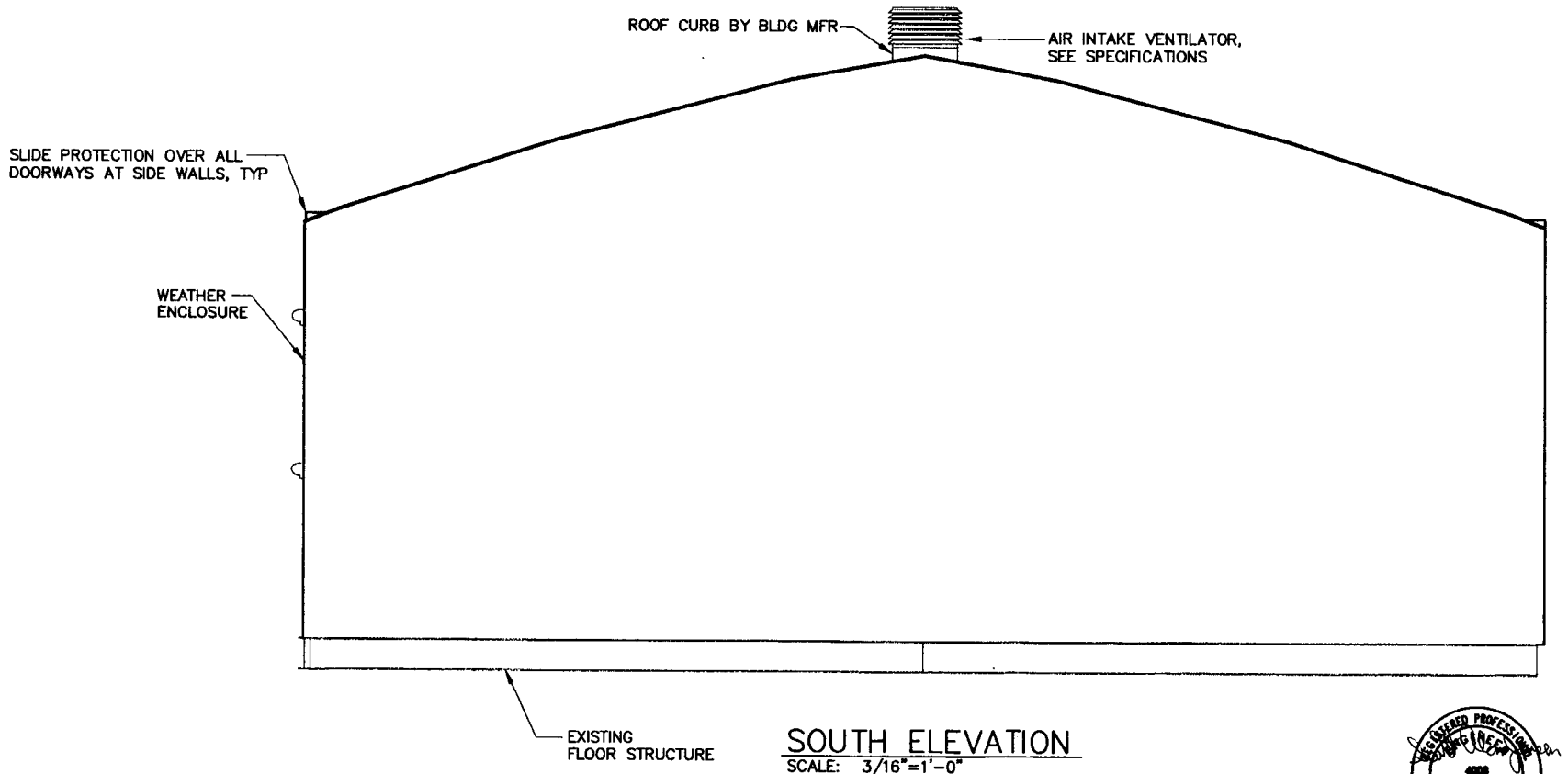


NORTH ELEVATION
SCALE: 3/16"=1'-0"



SOUTH ELEVATION
SCALE: 3/16"=1'-0"

X-REF DRAWINGS
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519677

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

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SCALE: 3/16" = 1'-0"	REQUESTER: SA DAVIES
DESIGN PHASE: PERF SPEC	DESIGN: DN NISHIOKA
SAFETY CATEGORY: LSC	DRAWN: B.SEARLE
	PROJECT NO. 021052
	SPEC CODE REC REL
	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846
	EFFECTIVE DATE: 5/10/02

INEEL — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE (WES)

ELEVATIONS

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG-	REV
		AREA	TYPE	Q	ORG		
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SCALE: 3/16" = 1'-0" SHEET A-3

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Layout Name: A-3 ELEVATIONS (2) ABE
Date: 05/09/02 - 1:19 P.M.

FMT-01-REV 3.3

REVISIONS		
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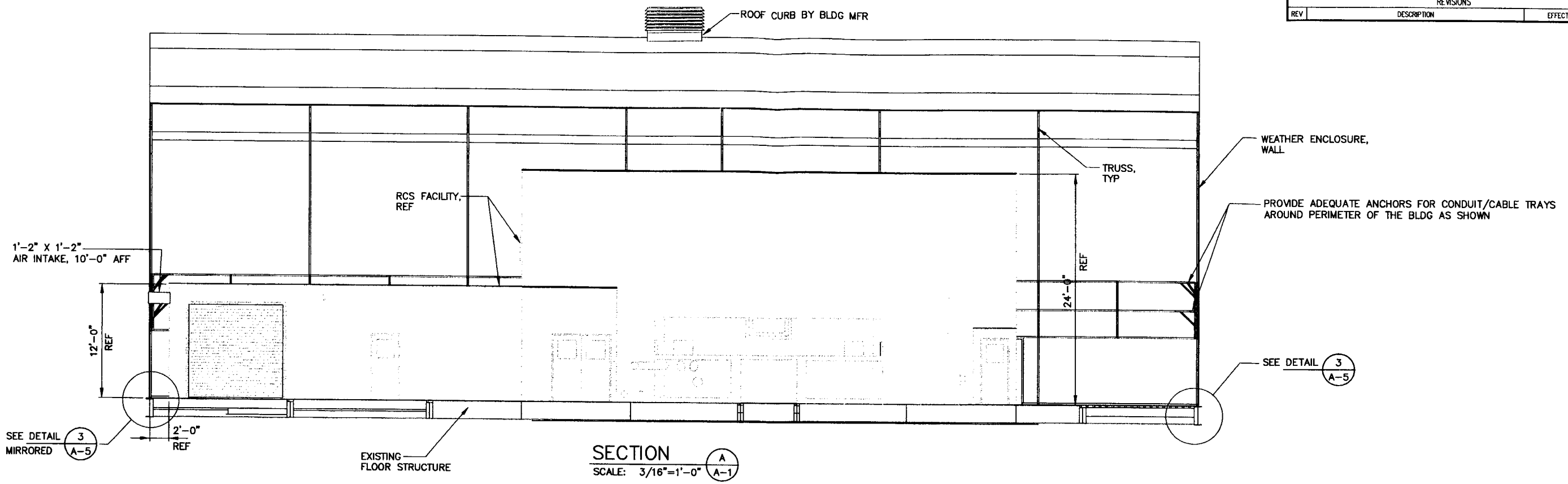
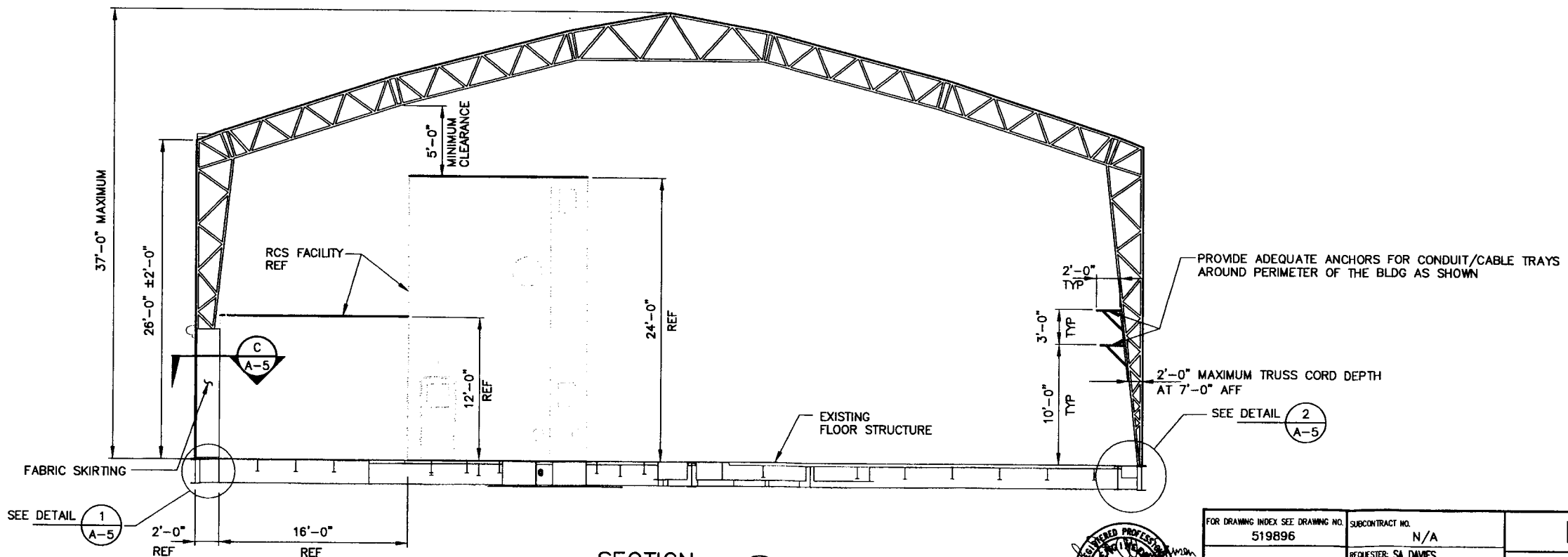


SECTION
SCALE: 3/16"=1'-0" (A A-1)



SECTION
SCALE: 3/16"=1'-0" (B A-1)

X-REF DRAWINGS
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519671-2
519677
519861

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO.	519896
SUBCONTRACT NO.	N/A
REQUESTER: SA DAVIES	
DESIGN: DN NISHIOKA	
DRAWN: B. SEARLE	
PROJECT NO.	021052
SPEC CODE	REC REL
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846	
EFFECTIVE DATE:	5/10/02
DESIGN PHASE: PERF SPEC	
SAFETY CATEGORY: LSC	

SCALE: 3/16" = 1'-0"

INEEL — Idaho National Engineering & Environmental Laboratory — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE (WES)

SECTIONS

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG-	REV
		AREA	TYPE	SI	OBJ		
D	01MF3	098	0671	00	090	519900	

SCALE: 3/16" = 1'-0" SHEET A-4

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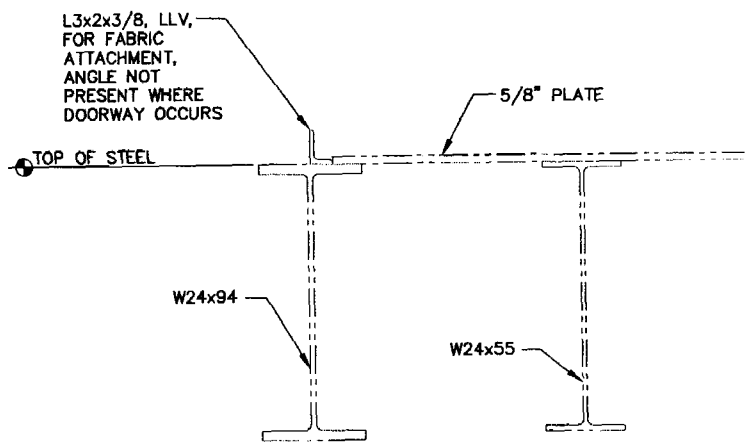
Path: V:\WES_PERF_SPEC
Layout Name: A-4 SECTIONS | ID: ABE
Date: 05/07/02 - 4:38 P.M.

FMT-01-REV 3.3

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:



EXISTING CONDITION

DETAIL 1 A-4

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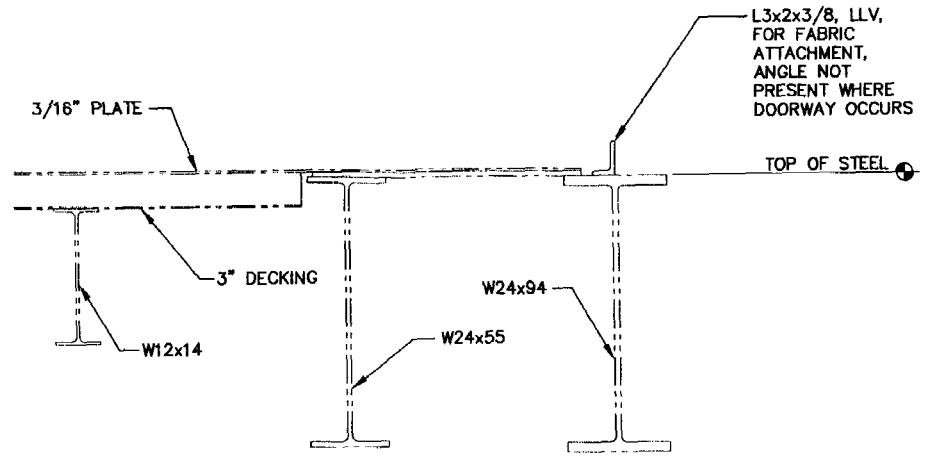

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DETAIL 2 A-4

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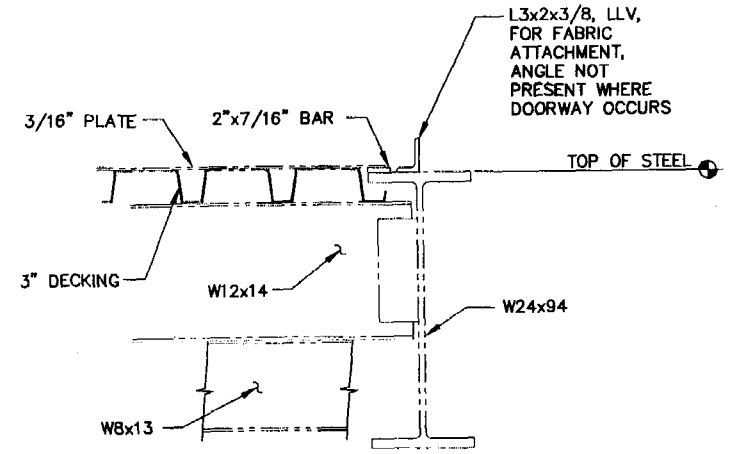

EXISTING CONDITION

DETAIL 3 A-4

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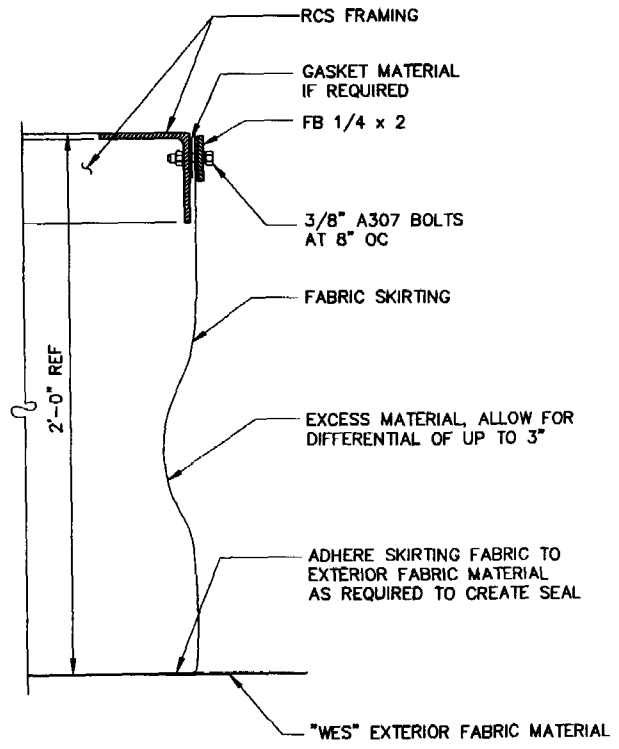

SECTION C A-1 C A-4

SCALE: 3"=1'-0"

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A
SCALE: 1 1/2" = 1'-0"	REQUESTER: SA DAVIES
SCALE: 3" = 1'-0"	DESIGN: DN NISHIOKA
DESIGN PHASE: PERF SPEC	DRAWN: CA BEHM
SAFETY CATEGORY: LSC	PROJECT NO. 021052
	SPEC CODE REC REL
	FOR REVIEW/APPROVAL SIGNATURES
	SEE DAR NO. 90846
	EFFECTIVE DATE: 5/10/02

INEEL — Idaho National Engineering & Environmental Laboratory — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE

DETAILS AND SECTION

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG-519901	REV
		AREA	TYPE	CL	ORG		
D	01MF3	098	0671	61	090		

SCALE: NOTED — SHEET A-5

Layout Name: A-5 EXIST DETAILS ABE
Date: 05/07/02 - 3:54 P.M.

File: 519901.dwg
Path: V:\WES_PERF_SPEC

Appendix C

Calculations

This appendix is for information only. It is not to be considered as part of the specification requirements. If a conflict exists between this Appendix and the body of this specification, the specification shall control.

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Document ID:EDF-2106
Revision ID: 0
Effective Date: May 10, 2002

EDF

PROJECT FILE NO. 021052

OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT

Weather Enclosure Structure Analysis and Loading Criteria

[The following statement is optional:
Prepared for:
U.S. Department of Energy
Idaho Operations Office
Idaho Falls, Idaho]

Idaho National Engineering and Environmental Laboratory

Form 412.14
07/24/2001
Rev. 03

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ENGINEERING DESIGN FILE

1. Title: Weather Enclosure Structure Analysis and Loading Criteria

2. Project File No.: 02152

3. Index Codes:
   Building/Type WMF-671 SSC ID WMF-671 WES Site Area RWMC

4. Summary:
This EDF documents the structural design and loading requirements for the Weather Enclosure structure (WES) for the Glovebox Excavator Method Project.

It also gives preliminary estimates of the WES weight, seimic base shear and wind loading forces. Wind loads are significantly higher tha earthquake loading for the WES.

5. Review (R) and Approval (A) and Acceptance (Ac) Signatures:
(See instructions for definitions of terms and significance of signatures.)

	R/A	Typed Name/Organization	Signature	Date
Author		Scott A. Jensen P.E.	Scott A Jensen	5/8/02
Checker	R	Stephanie Austand P.E.	Stephanie Austand	5/8/02
Independent Peer Reviewer	A	Patrick Bergassa P.E.	Pat Bergassa	5/9/02
Doc. Owner	A	Scott A. Jensen	Scott A Jensen	5/8/02
Requestor	Ac	S. A. Davies Project Engineering	S A Davies	5/10/02
Doc. Control				

6. Distribution: (Name and Mail Stop)
Hard copy distribution to: S.A. Davies (MS 3650), M.B. Pratt (MS 3950), OU 7-10 Glovebox Excavator Method Records Management (MS 3920), Scott Jensen, David Stephens. Electronic copy distribution to: B.R. Helm (MS 3765, bxh@inel.gov), OU 7-10 Glovebox Excavator Method Records Management (MS 3920, snarrll@inel.gov), Scott Jensen.

7. Does document contain sensitive unclassified information? ☐ Yes ☒ No
   If Yes, what category:

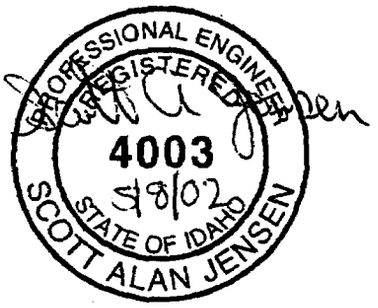
8. Can document be externally distributed? ☒ Yes ☐ No

9. Uniform File Code: 6400 Disposition Authority: ENV1-k-2-b
   Record Retention Period: End of Project + 25 yrs

10. For QA Records Classification Only: ☐ Lifetime ☒ Nonpermanent ☐ Permanent
    Item and activity to which the QA Record apply: WES

11. NRC related? ☐ Yes ☒ No

12. Registered Professional Engineer's Stamp (if required)



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Purpose

This EDF documents the structural design and loading requirements for the Weather Enclosure Structure (WES) for the OU 7-10 Glovebox Excavator Method Project.

Scope

This EDF is provides information necessary for preliminary structural analysis and design of the WES and for loading of the facility floor structure (FFS) that serves as the foundation for the WES.

Background

The Glovebox Excavator Method Project objective is to demonstrate the safe retrieval of TRU waste from a specific and preselected area (OU 7-10) of Pit 9 in the Subsurface Disposal Area (SDA) at the Radioactive Waste Management Complex (RWMC, part of the INEEL's Waste Area Group (WAG) 7.

The WES is the structure enclosing the operational area for this demonstration project. It is a tensioned membrane building system consisting of frames nominally spaced at 16'-8" on center covered with a waterproof fabric.

Safety Category

The WES is a low safety consequence structure. However, it is Performance Category 2 (PC-2) regarding wind and earthquake loading. It is protected from the effects of flood by RWMC dikes.

Most of the mechanical and electrical equipment within the WES is PC-1. This EDF also contains design information for earthquake loading for anchoring of PC-2 and PC-1 systems and components.

Analysis Approach

The calculations in this EDF provide information necessary for the design of the WES and structures associated with it. The primary goal of this EDF is to provide base reactions for the WES to be used in the FFS design. A secondary goal is to provide earthquake loading information for structures, systems and components associated with the WES.

The attached calculations estimate the weight, earthquake loading and wind loading for the WES. Wind Loads for Structures, a program by Standards Design Group, Inc. is used to calculate wind pressure profiles in accordance with ASCE 7-98. The results of the wind loading program were verified by other calculations not include herein. The earthquake loading calculations are based on the IBC 2000 requirements.

The results of the loading calculations were then used as input to a two-dimensional frame model using Multiframe 4D Version 8.04 by Formation Design Systems. The results of this model were checked against preliminary design information provided by a possible supplier for the WES. The loading provided herein should be representative. However, the FFS design will need to be checked using reactions provided in the WES final design. Since the frame used in the two-dimensional model is only used to obtain reactions, deflections and stresses in the model are not provided in this EDF.

The design of the WES is based on the requirements of the reference documents. More detail on design and analysis requirements is included hereafter.

Assumptions

A structural steel framework supports the WES.

Acceptance Criteria

The provisions of the International Building Code (IBC) 2000 shall govern the structural design and analysis of the WES unless otherwise noted herein (see TFR-154). The following chapters are particularly applicable to the WES design:

Chapter 16 Structural Design
Chapter 17 Structural Tests and Special Inspections
Chapter 22 Steel
Chapter 31 Special Construction

Analysis and Design Requirements and Criteria

General. The WES may be designed and constructed in accordance with any of the design methods and conventional construction methods permitted by the IBC.

Strength. Refer to IBC 1604.2 for requirements.

Serviceability. Refer to IBC 1604.3 for requirements. The drift limits applicable to earthquake loading may be exceeded if adequately justified.

The WES interfaces with an internal enclosure used as a staging area. Flexible connections may be necessary at the interface locations unless deflections are limited in those areas.

Analysis. Refer to IBC 1604.4.

Importance Factors. The seismic load importance factor for the WES shall be 1.5. The snow load importance factor is 1.2 and the wind load importance factor is 1.15.

Load Combinations. Refer to IBC 1605.

Dead Loads. Refer to IBC 1606.

Live Loads. Refer to IBC 1607.

Live loads shall include loads imposed by normal construction or erection procedures.

Snow Loads. Refer to IBC 1608. The ground snow load for the INEEL is 35 psf.

Wind Loads. Refer to IBC 1609. Comply with the provisions of ASCE 7 for a 3-second gust design wind speed of 90 mph.

Soil Lateral Load, Rain Loads and Flood Loads. Soil lateral load, rain loads and flood loads are not applicable to the WES.

Earthquake Loads. Refer to IBC 1613 through 1622. The following criteria shall be used for the WES.

Short period acceleration, Ss - 0.357 g's
1-sec acceleration, S1- 0.131 g's

Site Class - C
Seismic Importance Factor:
Ie - 1.5 for structures
Ip -1.5 for components
Seismic Use Group - III.

PC-1 systems and components shall be designed as Seismic Use Group I and with Ip = 1.0.

References

1. International Building Code 2000

2. DOE-STD-1020-2002 January 2002, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

3. ASCE 7-98 Minimum Design Loads for Buildings and Other Structures

4. TFR-154 Revision 0, System Design Criteria for the Operable Unit 7-10 Glovebox Excavator Method Project, General Structures and Site Design Criteria, March 2002.

Calculations

See the attached calculations for an estimate of the WES weight, calculations for earthquake loading for the main framework and components, and reaction loads on the FFS.

Conclusions

The preliminary calculation for the weight of the WES is 165,000 pounds.

The preliminary calculation for the total base shear from earthquake loading of the WES is 17,700 pounds. Maximum wind forces are approximately 72,000 pounds perpendicular to the long axis and 42,000 pound parallel to the long axis. Wind forces govern the design for horizontal forces.

Attachments

WES Weight & Earthquake Loading Calculations – 6 Pages

Glovebox Excavator Method WES ASCE 7 Wind Loading – 9 Pages

WES Frame Loading Reaction Output Plots – 9 Pages

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Attachment 1 Preliminary Weight and Loading Calculations

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Purpose

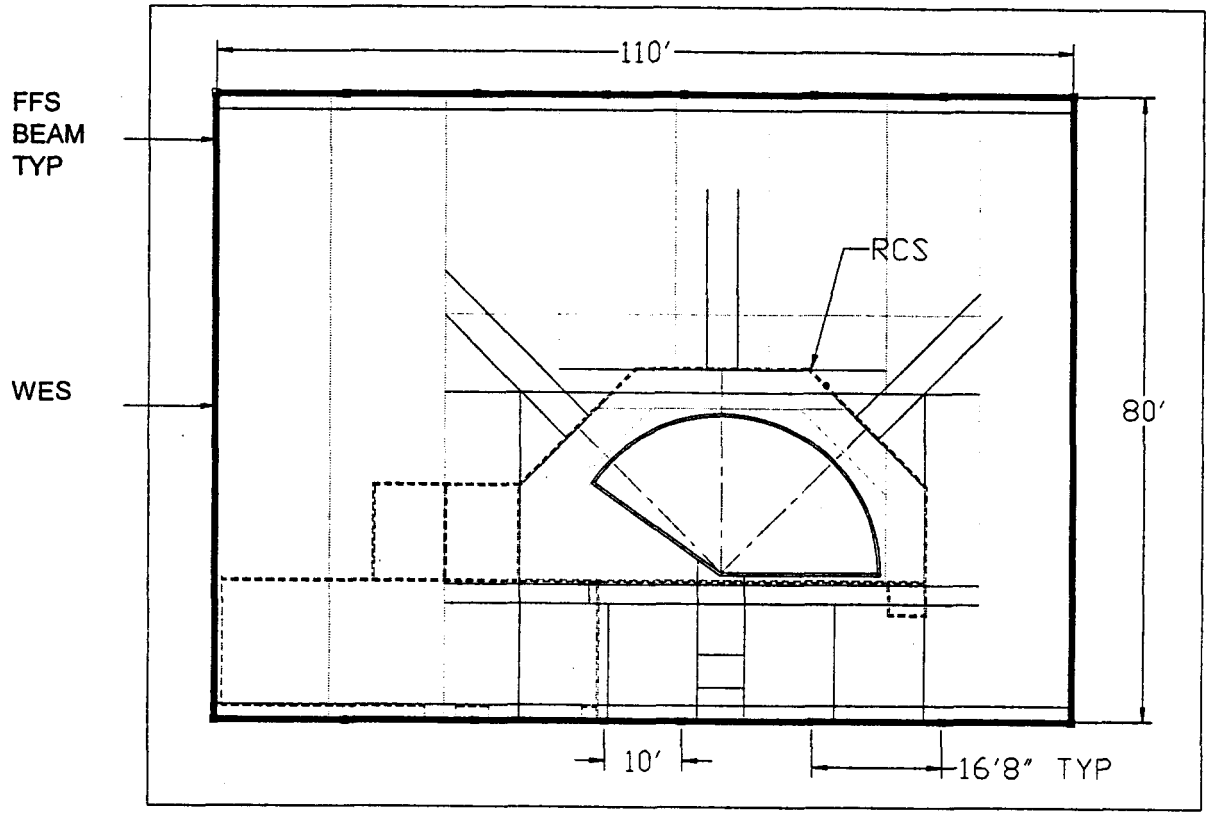
The purpose of these calculations is to determine a preliminary estimate of the weight earthquake loading and wind loading of the WES. These calculations will also determine the governing horizontal load for the WES and provide input to be used in determining reaction loads of the WES on the FFS.

Scope

These calculations are limited to the previously stated purpose.

Assumptions/Criteria Refer to WES preliminary drawings for more information on the WES configuration. The wind loading software input used one foot higher heights in order to be conservative.

WES dimensions: $L := 110 \cdot ft$ $B := 80 \cdot ft$ $H := 26 \cdot ft$ $H1 := 37 \cdot ft$



$H2 := H1 - H$ $H2 = 11\,ft$

$$B1 := \sqrt{\left(\frac{B}{2}\right)^2 + H2^2} \qquad B1 = 41.5\,ft$$

Frame spacing $sp := 16ft + 8 \cdot in$ $sp = 16.67\,ft$

Steel unit weight: $\gamma s := 490 \cdot pcf$

Earthquake load criteria: $Ss := 0.357$ $S1 := 0.131$ $Ie := 1.5$

Site Class C Seismic Use Group - III for the WES

Seisimic Use Group - I for PC-1 equipment

Acceptance Criteria Not applicable to these calculations.

Weight Calculations

Calculate roof area $Aroof := L \cdot 2 \cdot B1$ $Aroof = 9127\,ft^2$

Calculate wall areas $A1 := L \cdot H$ $A1 = 2860\,ft^2$

$A2 := A1$ $A2 = 2860\,ft^2$

$A3 := B \cdot H + \frac{B \cdot H2}{2}$ $A3 = 2520\,ft^2$

$A4 := A3$ $A4 = 2520\,ft^2$

$Awall := A1 + A2 + A3 + A4$ $Awall = 10760\,ft^2$

Estimate weight per square foot of WES walls and ceiling

Estimate weight of main truss framing members	$\frac{35plf}{sp} = 2.10\,psf$
Estimate weight of secondary framing members	$1 \cdot psf$
Estimate weight of fabric and insulation	$2 \cdot psf$
Assume weight of sprinkler system	$3.5 \cdot psf$
Assume weight of lights & conduit	$1.5 \cdot psf$
Assume weight of H&V components	$2 \cdot psf$

Dead weight of roof and walls: Collateral weight of roof:

$2.1 + 1 + 2 = 5.1$ $wr := 5.1 \cdot psf$ $3.5 + 1.5 + 2 = 7.0$ $wco := 7 \cdot psf$

Roof weight	$Wroof := Aroof \cdot wr$	$Wroof = 46.55\,kip$	$wr \cdot sp = 85.0\,plf$
Colateral weight	$Wco := Aroof \cdot wco$	$Wco = 63.89\,kip$	$wco \cdot sp = 116.7\,plf$
Wall weight	$Wwall := Awall \cdot wr$	$Wwall = 54.88\,kip$	$wr \cdot sp = 85.0\,plf$

$W := Wroof + Wco + Wwall$ $W = 165.31\,kip$

WES Structure Earthquake Loading Calculations

$Ss = 0.36$ $S1 = 0.13$ $Fa := 1.2$ See IBC Table 1615.1.2(1)

$Fv := 1.67$ See IBC Table 1615.1.2(2)

Equation 16-16	$Sms := Fa \cdot Ss$	$Sms = 0.43$	
Equation 16-17	$Sm1 := Fv \cdot S1$	$Sm1 = 0.22$	
Equation 16-18	$Sds := \frac{2}{3} \cdot Sms$	$Sds = 0.29$	Equates to Seismic Design Category D. See Table 1616.3 based on 1 second period accel.
Equation 16-19	$Sd1 := \frac{2}{3} \cdot Sm1$	$Sd1 = 0.15$	

$Ct := 0.020$ Equation 16-39 $Ta := Ct \cdot \left(\frac{H1}{ft}\right)^{\frac{3}{4}}$ $Ta = 0.30$

$R := 4$ See Table 1617.6 Bearing Wall System - Ordinary steel braced frames

$Cs1 := \frac{Sds}{\left(\frac{R}{Ie}\right)}$ Equation 16-35 $Cs1 = 0.11$

$Csmin := 0.044 \cdot Sds \cdot Ie$ Equation 16-37 $Csmin = 0.02$

$Csmax := \frac{Sd1}{\left(\frac{R}{Ie}\right) \cdot Ta}$ Equation 16-36 $Csmax = 0.18$

$Cs := if(Cs1 < Csmin, Csmin, if(Cs1 > Csmax, Csmax, Cs1))$ $Cs = 0.11$

Seismic Base Shear (Equation16-34) $V := Cs \cdot W$ $V = 17.70\,kip$

WES Earthquake Loading Calculations for PC-2 Components Supported at the Ceiling

$ap := 1.0$ $Rp := 1.25$ $z := H$ $Ip := 1.5$

$Fpf1 := \frac{0.4 \cdot ap \cdot Sds}{\frac{Rp}{Ip}} \cdot \left(1 + 2 \cdot \frac{z}{H}\right) Wp$ $Fpf1 = 0.41$ x weight Equation 16-67

$Fpmax := 1.6 \cdot Sds \cdot Ip$ $Fpmax = 0.69$ Equation 16-68

$Fpmin := 0.3 \cdot Sds \cdot Ip$ $Fpmin = 0.13$ Equation 16-69

$Fpf := if(Fpf1 < Fpmin, Fpmin, if(Fpf1 > Fpmax, Fpmax, Fpf1))$ $Fpf = 0.41$ x weight

WES Earthquake Loading Calculations for PC-2 Components Supported at Floor Level

$z := 0 \cdot ft$

$Fpf1 := \frac{0.4 \cdot ap \cdot Sds}{\frac{Rp}{Ip}} \cdot \left(1 + 2 \cdot \frac{z}{H}\right) Wp$ $Fpf1 = 0.14$ x weight Equation 16-67

$Fpf := if(Fpfl < Fpmin, Fpmin, if(Fpfl > Fpmax, Fpmax, Fpfl))$ $Fpf = 0.14$ x weight

WES Earthquake Loading Calculations for PC-1 Components Supported at the Ceiling

$z := H$ $Ip := 1.0$

$$Fpfl := \frac{0.4 \cdot ap \cdot Sds}{\frac{Rp}{Ip}} \cdot \left(1 + 2 \cdot \frac{z}{H}\right) Wp$$ $Fpfl = 0.27$ x weight Equation 16-67

$Fpmax := 1.6 \cdot Sds \cdot Ip$ $Fpmax = 0.46$ Equation 16-68

$Fpmin := 0.3 \cdot Sds \cdot Ip$ $Fpmin = 0.09$ Equation 16-69

$Fpf := if(Fpfl < Fpmin, Fpmin, if(Fpfl > Fpmax, Fpmax, Fpfl))$ $Fpf = 0.27$ x weight

WES Earthquake Loading Calculations for PC-1 Components Supported at Floor Level

$z := 0 \cdot ft$

$$Fpfl := \frac{0.4 \cdot ap \cdot Sds}{\frac{Rp}{Ip}} \cdot \left(1 + 2 \cdot \frac{z}{H}\right) Wp$$ $Fpfl = 0.09$ x weight Equation 16-67

$Fpf := if(Fpfl < Fpmin, Fpmin, if(Fpfl > Fpmax, Fpmax, Fpfl))$ $Fpf = 0.09$ x weight

WES Wind Loading Calculations PC-2 (Refer to output from Wind Loads on Structures for design wind pressures)

Wind perpendicular to building long axis (Refer to Multiframe reaction printouts for maximum horizontal reactions)

Wind 1a $7.17 \cdot kip + 1.87 \cdot kip = 9.04\,kip$ Wind 1b $6.98 \cdot kip + 3.98 \cdot kip = 10.96\,kip$

Wind 1c $7.26 \cdot kip + 1.76 \cdot kip = 9.02\,kip$

Maximum wind force on the WES $\frac{10.96 \cdot kip}{sp} \cdot L = 72.34\,kip$

Wind parallel to building long axis Wind 2b

Windward wall force $(15.3 \cdot psf \cdot 15 \cdot ft + 16.1 \cdot psf \cdot 5 \cdot ft + 16.7 \cdot psf \cdot 5 \cdot ft + 16.9 \cdot psf \cdot 2 \cdot ft) \cdot B = 34.18\,kip$

$$17.2 \cdot psf \cdot \frac{(58.18 \cdot ft + 80 \cdot ft)}{2} \cdot 3 \cdot ft + 17.4 \cdot psf \cdot \frac{(58.18 \cdot ft + 40 \cdot ft)}{2} \cdot 2.5 \cdot ft + 17.8 \cdot psf \cdot \frac{40 \cdot ft}{2} \cdot 5.5 \cdot ft = 7.66\,kip$$

Maximum horiz wind force on the WES $34.18 \cdot kip + 7.66 \cdot kip = 41.84\,kip$

Maximum uplift on the WES main supports from wind loading (Refer to Multiframe reaction printouts for maximum vertical reactions)

Wind 1a $10.6 \cdot kip + 7.08 \cdot kip = 17.68\,kip$ Wind 2b $2 \cdot 12.72 \cdot kip = 25.44\,kip$

The wind 1a condition can occur along the entire building length. The wind 2b condition only occurs for the first 32.5 feet on the windward side of the roof.

Approximate total uplift from the wind is $\frac{17.68 \cdot kip}{sp} \cdot L = 116.69\,kip$

$$\frac{25.44 \cdot kip}{sp} \cdot \left(32.5 \cdot ft + \frac{12.2}{19.1} \cdot 32.5 \cdot ft + \frac{8.8}{19.1} \cdot 45 \cdot ft \right) = 112.94\,kip$$

Conclusions

Total weight of the WES is approximately $W = 165.31\,kip$

Seismic base shear for the WES is approximately $V = 17.70\,kip$

The design wind forces in either direction for the WES are much higher than the design seismic base shear. Wind loading will govern the WES design. Earthquake loading need not be considered for the weather enclosure structure.

Maximum horizontal wind forces are approximately 72 kips perpendicular to the long axis and 42 kips parallel to the long axis.

The following design g forces should be used for anchoring of mechanical and electrical equipment in the WES.

PC-1 @ ceiling height	0.27 gs
PC-1 @ floor level	0.09 gs
PC-2 @ ceiling height	0.41 gs
PC-2 @ floor level	0.14 gs

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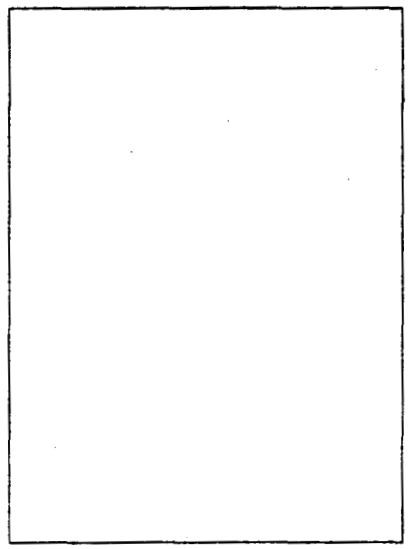
Attachment 2 ASCE 7 Wind Loading

The following pages are the output from an ASCE 7 based program that calculates wind pressures for buildings and other structures.

Project Name: Glovebox Excavator Method WES



Location: RWMC, INEEL

By: Scott A. Jensen

Start Date: 3/1/2002

Comments:

Local Information

Wind Dir.	Exposure
1	C
2	C
3	C
4	C

Basic Wind Speed: 90 mph

Topography: None

Optional Factors

Gust Effect Factor = 0.85

This project uses load combinations from ASCE 7.

Section - Main Section

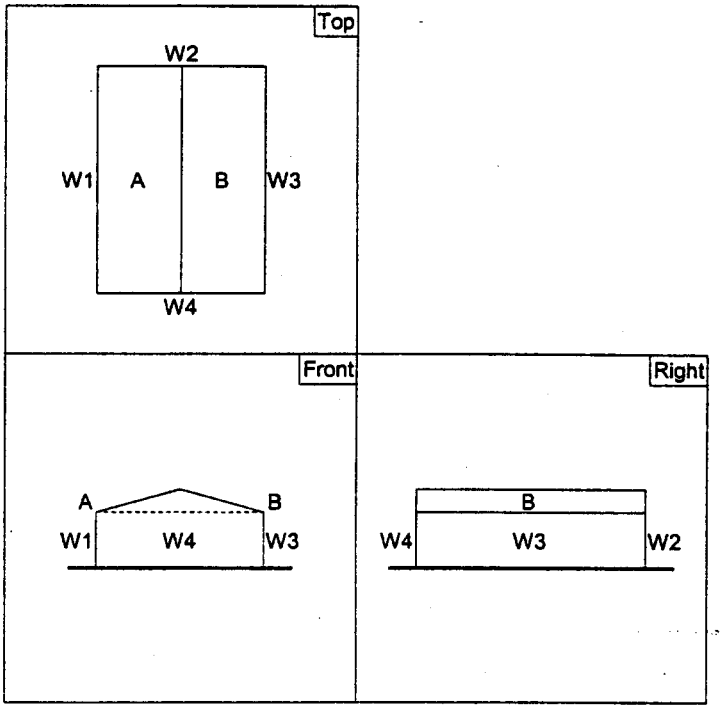
Enclosure Classification: Enclosed
Building Category: IV

Wall	Length(ft)	Overhang(ft)
1	110.0	0.0
2	80.0	0.0
3	110.0	0.0
4	80.0	0.0

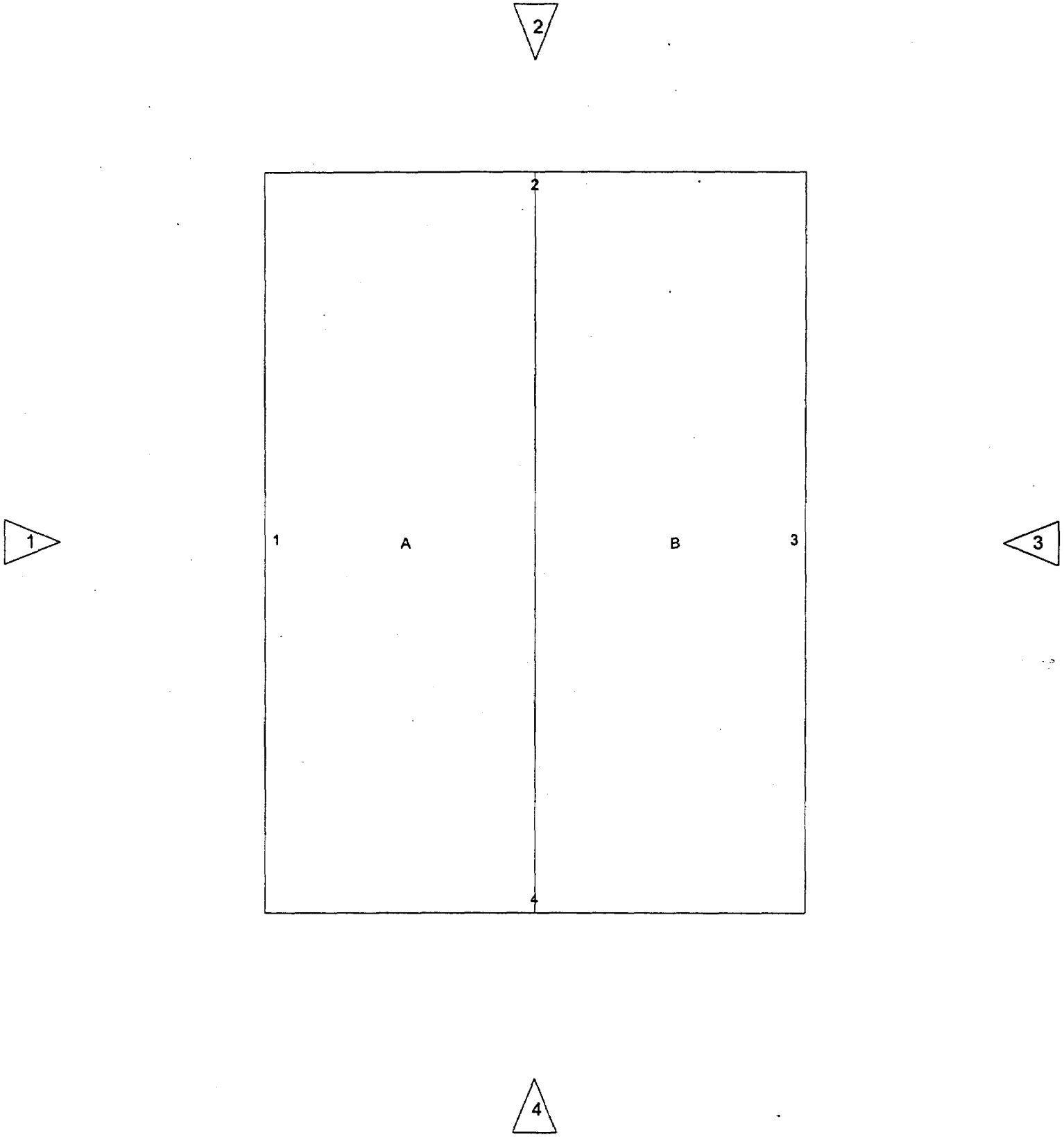
Wall Height: 27 ft
Parapet Height: 0 ft

Roof Shape: Gabled

Roof	Slope(:12)
A&B	3.3



Composite Drawing



MWFRS Net Pressures

This data was calculated using the building of all heights method.

Wind Direction 1

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Windward Wall	15.0	17.2	0.85	0.80	0.18	11.7	8.1	15.3
		20.0	18.3				12.4	8.8	16.1
		25.0	19.2				13.1	9.4	16.7
		27.0	19.5				13.3	9.6	16.9
2	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
3	Leeward Wall	32.5	20.2	0.85	-0.50	0.18	-8.6	-12.2	-4.9
4	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
A	Windward Roof	32.5	20.2	0.85	0.01	0.18	0.2	-3.5	3.8
		32.5	20.2		-0.61		-10.5	-14.1	-6.8
B	Leeward Roof	32.5	20.2	0.85	-0.51	0.18	-8.8	-12.4	-5.1

MWFRS Net Pressures

This data was calculated using the building of all heights method.

Wind Direction 2

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
2	Windward Wall	15.0	17.2		0.80		11.7	8.1	15.3
		20.0	18.3				12.4	8.8	16.1
		25.0	19.2				13.1	9.4	16.7
		30.0	19.9				13.5	9.9	17.2
		32.5	20.2				13.7	10.1	17.4
		38.0	20.9				14.2	10.6	17.8
3	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
4	Leeward Wall	32.5	20.2	0.85	-0.43	0.18	-7.4	-11.0	-3.7
A&B	Roof	0 to 16.3	20.2	0.85	-0.90	0.18	-15.5	-19.1	-11.8
		16.3 to 32.5	20.2				-15.5	-19.1	-11.8
		32.5 to 65.0	20.2		-0.50		-8.6	-12.2	-4.9
		65.0 to 110.0	20.2		-0.30		-5.2	-8.8	-1.5

MWFRS Net Pressures

This data was calculated using the building of all heights method.

Wind Direction 3

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Leeward Wall	32.5	20.2	0.85	-0.50	0.18	-8.6	-12.2	-4.9
2	Side Wall	32.5	20.2		-0.70		-12.0	-15.7	-8.4
3	Windward Wall	15.0	17.2	0.85	0.80	0.18	11.7	8.1	15.3
		20.0	18.3				12.4	8.8	16.1
		25.0	19.2				13.1	9.4	16.7
		27.0	19.5				13.3	9.6	16.9
4	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
B	Windward Roof	32.5	20.2	0.85	0.01	0.18	0.2	-3.5	3.8
		32.5	20.2		-0.61		-10.5	-14.1	-6.8
A	Leeward Roof	32.5	20.2	0.85	-0.51	0.18	-8.8	-12.4	-5.1

MWFRS Net Pressures

This data was calculated using the building of all heights method.

Wind Direction 4

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
2	Leeward Wall	32.5	20.2		-0.43		-7.4	-11.0	-3.7
3	Side Wall	32.5	20.2	0.85	-0.70	0.18	-12.0	-15.7	-8.4
4	Windward Wall	15.0	17.2	0.85	0.80	0.18	11.7	8.1	15.3
		20.0	18.3				12.4	8.8	16.1
		25.0	19.2				13.1	9.4	16.7
		30.0	19.9				13.5	9.9	17.2
		32.5	20.2				13.7	10.1	17.4
		38.0	20.9				14.2	10.6	17.8
A&B	Roof	0 to 16.3	20.2	0.85	-0.90	0.18	-15.5	-19.1	-11.8
		16.3 to 32.5	20.2				-15.5	-19.1	-11.8
		32.5 to 65.0	20.2		-0.50		-8.6	-12.2	-4.9
		65.0 to 110.0	20.2		-0.30		-5.2	-8.8	-1.5

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Attachment 3 WES Structural Frame Reactions

The following 8 pages show the preliminary design reaction forces for several load cases for the WES. The conservatism of these reactions will need to be confirmed by the WES supplier.

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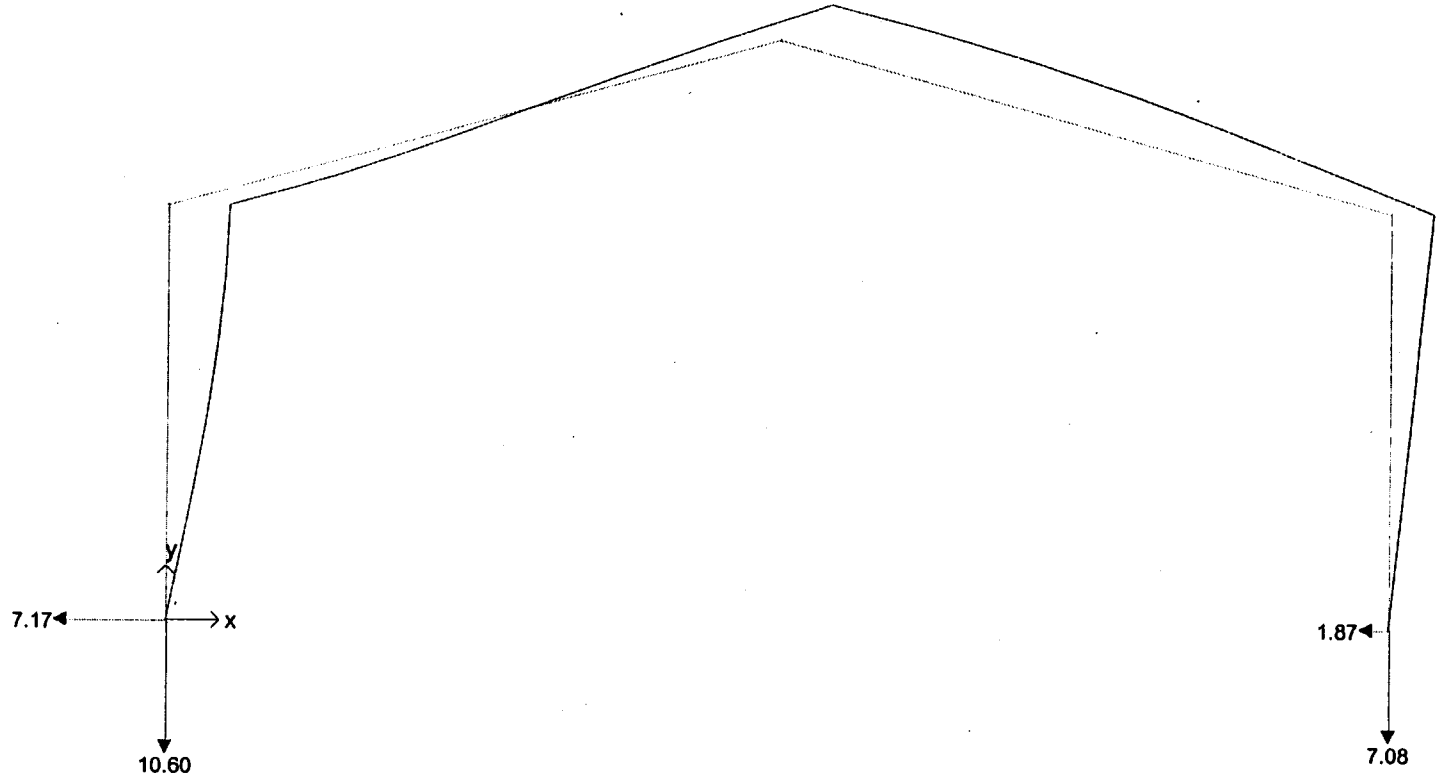
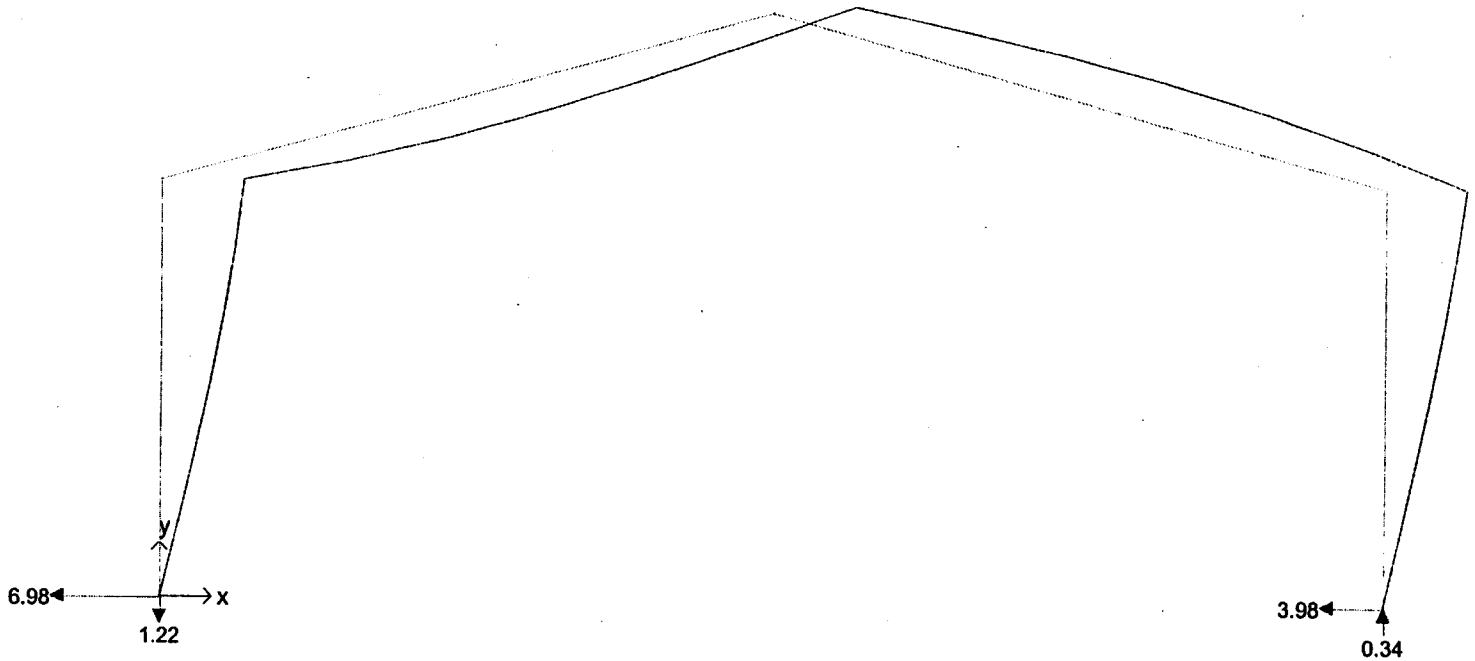
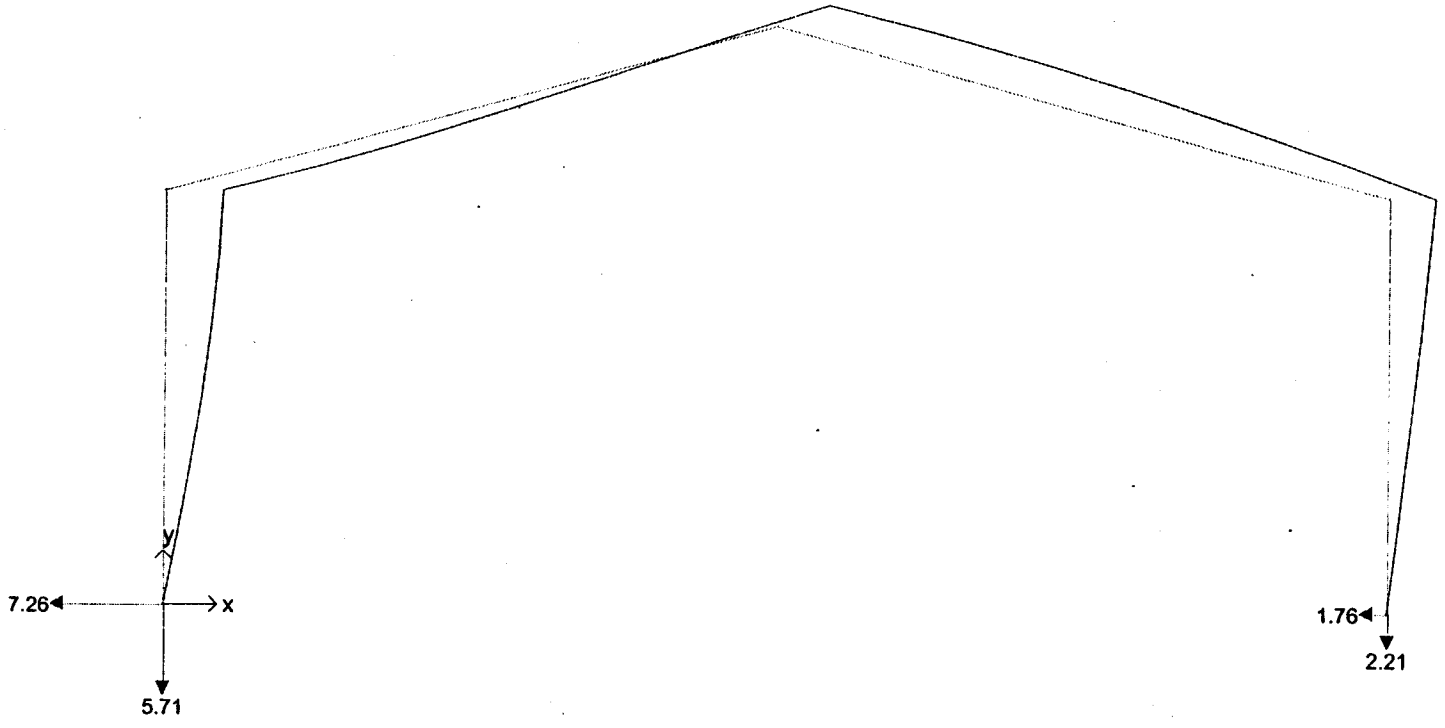


Plot View - Static Case: Wind 1a Defl. (in)



Plot View - Static Case: Wind 1b Defl. (in)



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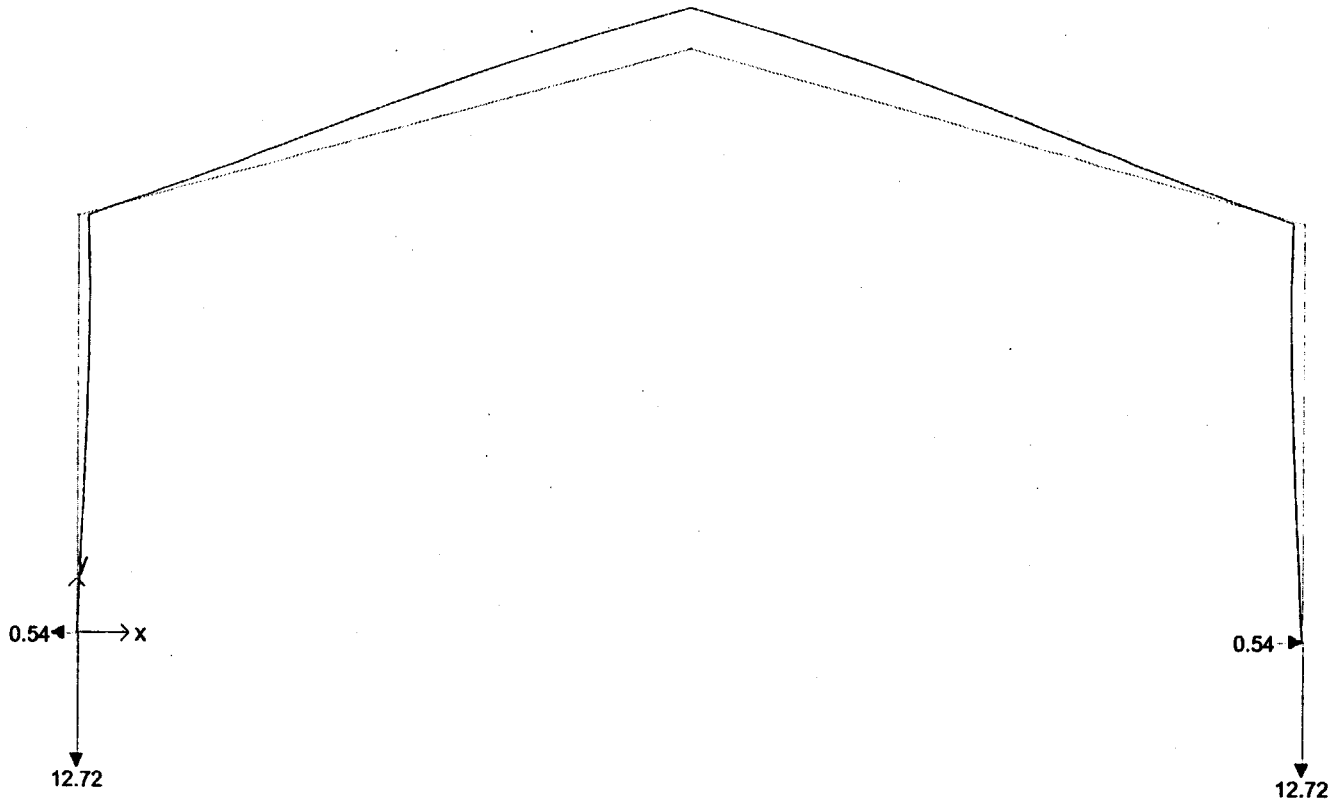

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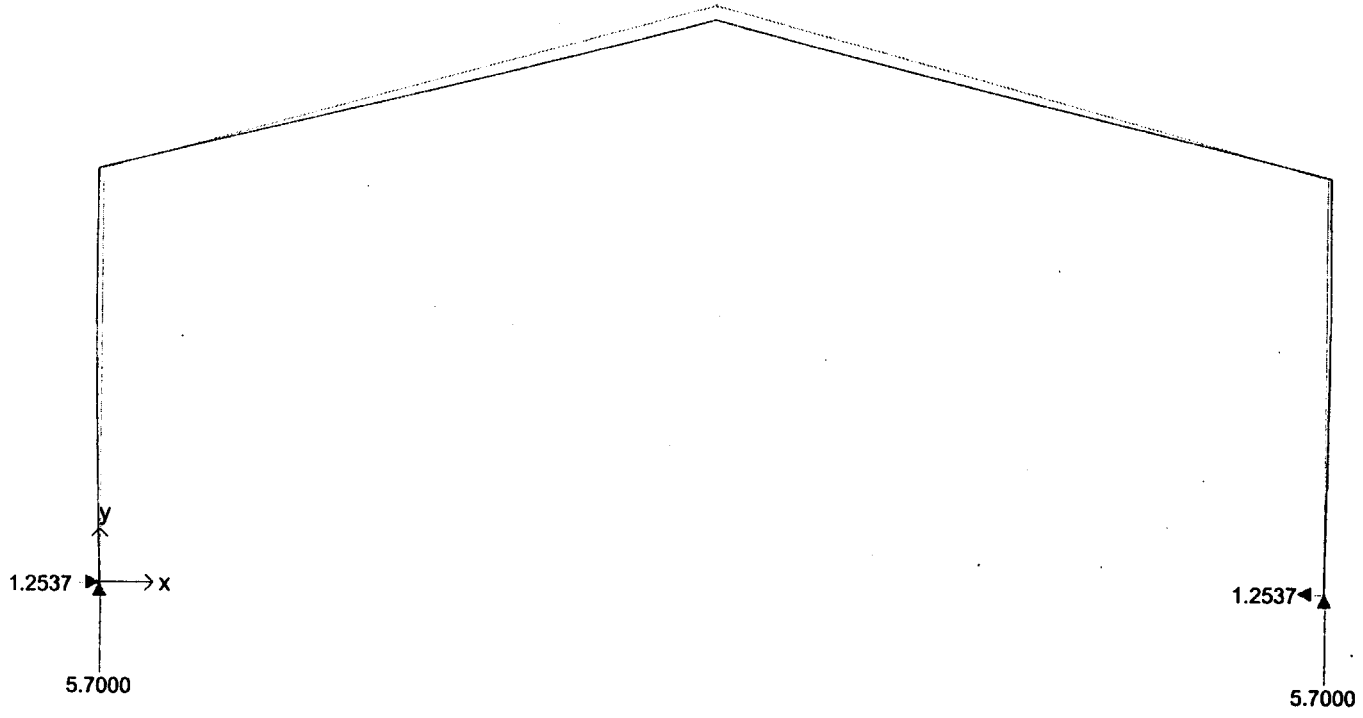
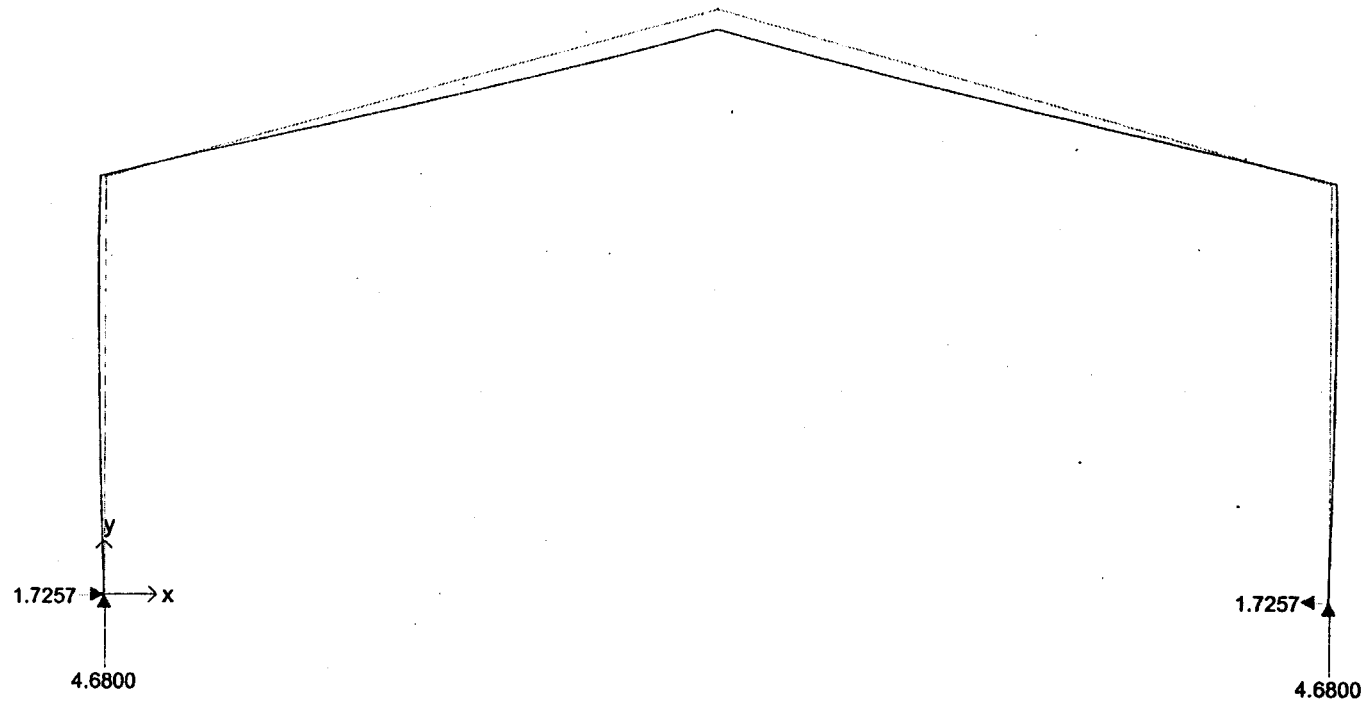
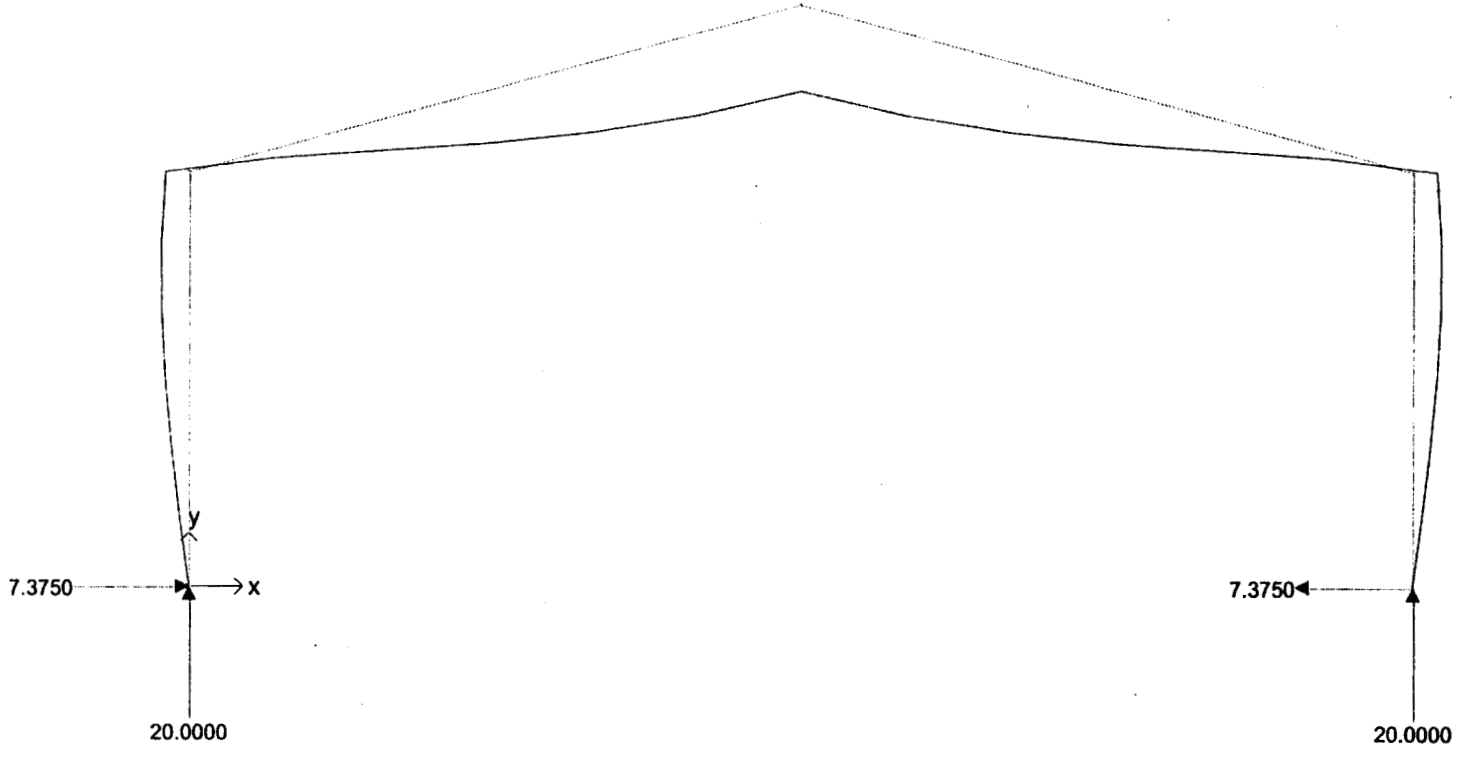


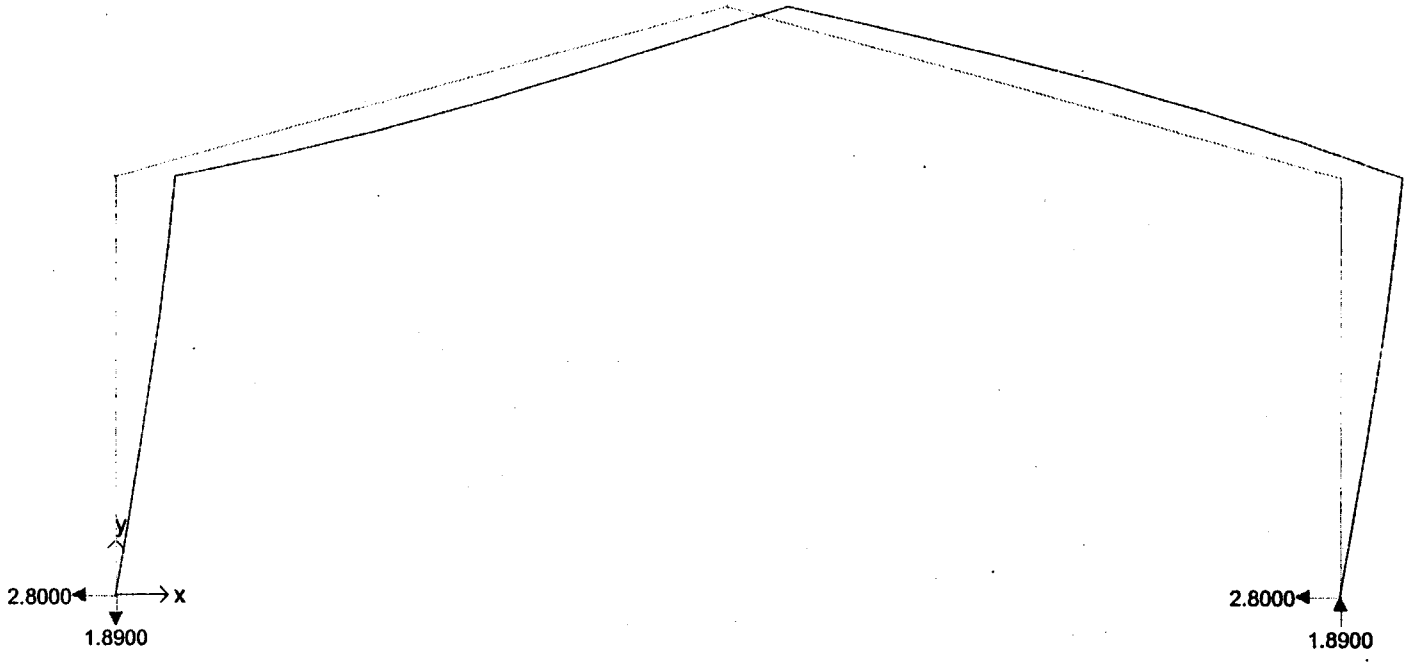
Plot View - Static Case: Fabric & Sec Framing Defl. (in)



Plot View - Static Case: Colateral Defl. (in)



Plot View - Static Case: Snow Defl. (in)

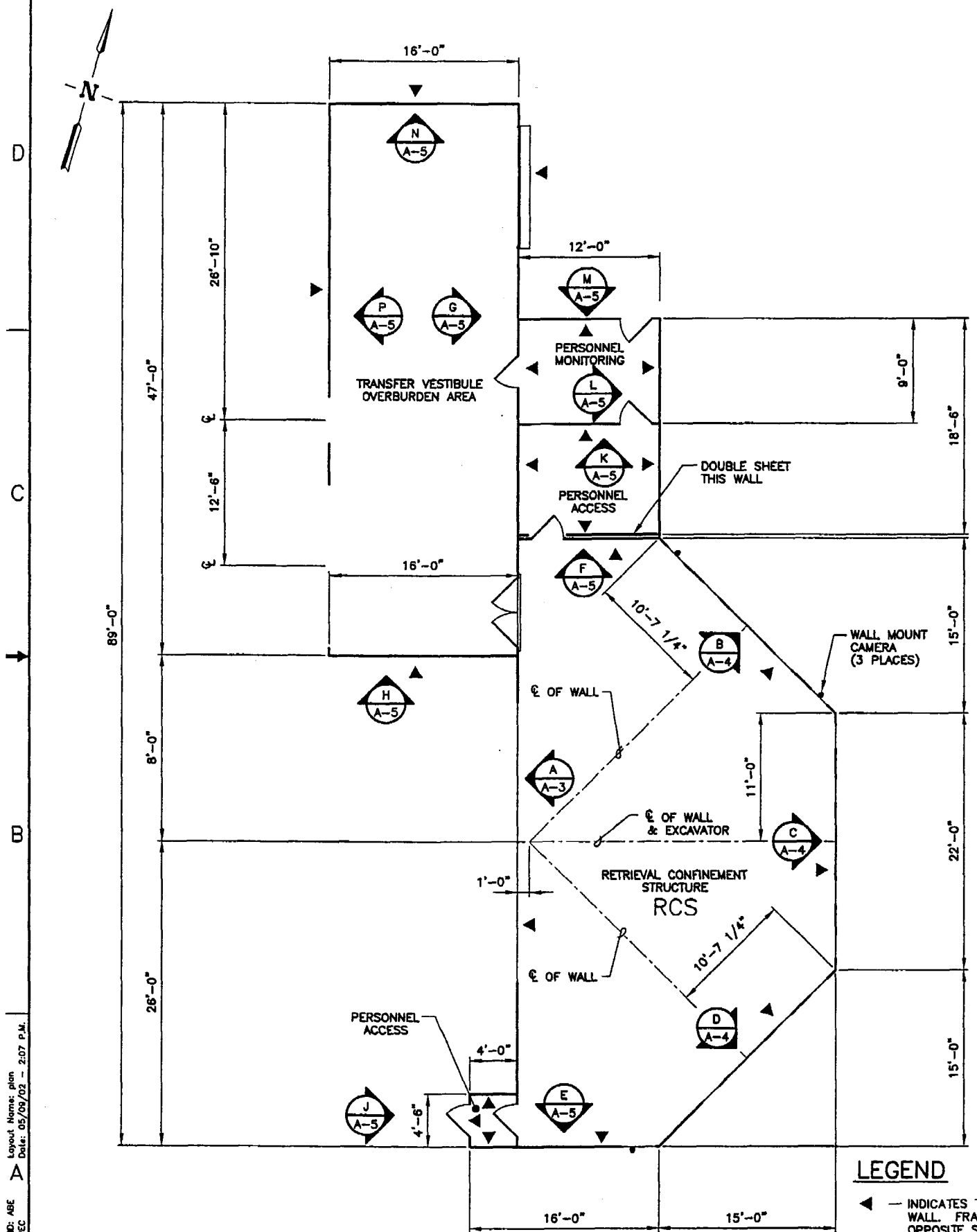


Plot View - Static Case: Earthquake Defl. (in)

Appendix D

Retrieval Confinement Structure Reference Drawings

(For Information Only)



PLAN
SCALE: 3/16"=1'-0"

LEGEND

◀ — INDICATES THE SMOOTH SIDE OF PANEL WALL. FRAMING MEMBERS FOR WALL ON OPPOSITE SIDE OF INDICATOR.

OPENING LEGEND

TYPE	NOMINAL SIZE	QUANTITY	TYPE OF OPENING	GLAZING	POSITIONAL TOLERANCES	REMARKS
A	8'-0" X 4'-0"	5	WINDOW OPENING	LEXAN	HORIZ: ±3", VERT: +6	OBSERVATION
B	30" DIAMETER	1	FRAMED OPENING	NONE	HORIZ: ±6", VERT: ±6"	AIR INLET – 1 1/2" MIN. FLANGE REQ'D
C	12" DIAMETER	4	FRAMED OPENING	NONE	HORIZ: ±6", VERT: ±6"	AIR INLET
D	2'-0" X 2'-0"	2	FRAMED OPENING	NONE	HORIZ: ±6", VERT: -6"	AIR INLET
E	4'-2 3/4" X 4'-2 3/4"	3	FRAMED OPENING	NONE	HORIZ: ±1", VERT: ±1"	OPENING FOR GLOVE BOX
F	2'-0" X 2'-0"	11	WINDOW OPENING	LEXAN	HORIZ: ±2", VERT: ±2"	OBSERVATION
G	2'-0" X 2'-0"	3	WINDOW OPENING	LEXAN	HORIZ: ±2", VERT: ±2"	CAMERA
H	1'-6" X 7'-6"	1	FRAMED OPENING	NONE	HORIZ: +3", VERT: ±3"	HEPA INLET – 1 1/2" MIN. FLANGE REQ'D
J	6'-0" X 4'-7"	1	FRAMED OPENING	NONE	HORIZ: ±1", VERT: ±1"	OPENING FOR EXCAVATOR
K	8" DIAMETER	1	SEE NOTE 3	NONE	HORIZ: ±6", VERT: -3"	OPENING FOR GROUT AT LATER PHASE
L	4" DIAMETER	2	SEE NOTE 3	NONE	HORIZ: ±6", VERT: -3"	OPENING FOR AIR SAMPLING PORT
M	14" X 14"	1	FRAMED OPENING	NONE	HORIZ: ±6", VERT: ±6"	OPENING FOR FAN
N	2" X 3"	1	SEE NOTE 3	NONE	HORIZ: ±6", VERT: -6"	OPENING FOR BREATHING AIR
P	4" DIAMETER	1	SEE NOTE 3	NONE	HORIZ: ±6"	OPENING AT ROOF

DOOR OPENING LEGEND

TYPE	NOMINAL SIZE	QUANTITY	NOMINAL SIZE OF GLAZING	TYPE OF GLAZING	TYPE OF OPENING	REMARKS
1	3'-0" X 7'-0"	6	2'-0" X 2'-0"	LEXAN	DOOR OPENING	
2	6'-0" X 7'-0"	1	2'-0" X 2'-0"	LEXAN	DOOR OPENING	GLAZING IN EACH DOOR
3	10'-0" X 10'-0"	1	———	———	COILING DOOR OPENING	
4	4'-0" X 8'-0"	1	———	———	DOOR OPENING	NO DOOR REQUIRED – FRAMED OPENING ONLY
5	14'-0" X 12'-0"	1	———	———	DOOR OPENING	NO DOOR REQUIRED – FRAMED OPENING ONLY

NOTES

1. PLAN DIMENSIONS ARE FROM INSIDE OF WALL TO INSIDE OF WALL (NOMINAL) OR FROM INSIDE OF WALL TO CENTER LINE (NOMINAL).
2. SEE SHEETS A-3, A-4 & A-5 FOR WALL DIMENSIONS.
3. PENETRATION TO BE FIELD CUT BY OTHERS.
4. RETRIEVAL CONFINEMENT STRUCTURE BEARS ON 1/2" MINIMUM CARBON STEEL PLATE SUPPORTED BY CARBON STEEL WIDE FLANGE BEAMS.

INFORMATION ONLY

RELEASED FOR RECORD ONLY

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X-REF DRAWING
519671 (BOUND)

REVISION: 0
ORIGINAL SIGNED BY: SCOTT ALAN JENSEN
DATE ORIGINAL SIGNED: 4/9/02
SEAL NUMBER: 4003
ORIGINAL STORED AT: EROB DOCUMENT CONTROL

REGISTERED PROFESSIONAL ENGINEER 4003 STATE OF IDAHO SCOTT ALAN JENSEN

FOR DRAWING INDEX SEE DRAWING NO. 519888
SUBCONTRACT NO. N/A
SCALE: 3/16" = 1'-0"
REQUESTER: S.A. DAVIES
DESIGN: S. JENSEN
DRAWN: B.SEARLE
PROJECT NO. 021052
SPEC CODE REC REL
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90072
DESIGN PHASE: PERF SPEC
SAFETY CATEGORY: SS
EFFECTIVE DATE: 4/9/02

INEEL
OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
RETRIEVAL CONFINEMENT STRUCTURE
FLOOR PLAN AND LEGENDS
SIZE D | CAGE CODE 01MF3 | DWG-519889 | REV
AREA 098 | TYPE 0671 | ID 00 | ORG 090
SCALE: NOTED
SHEET A-1

REVISIONS		
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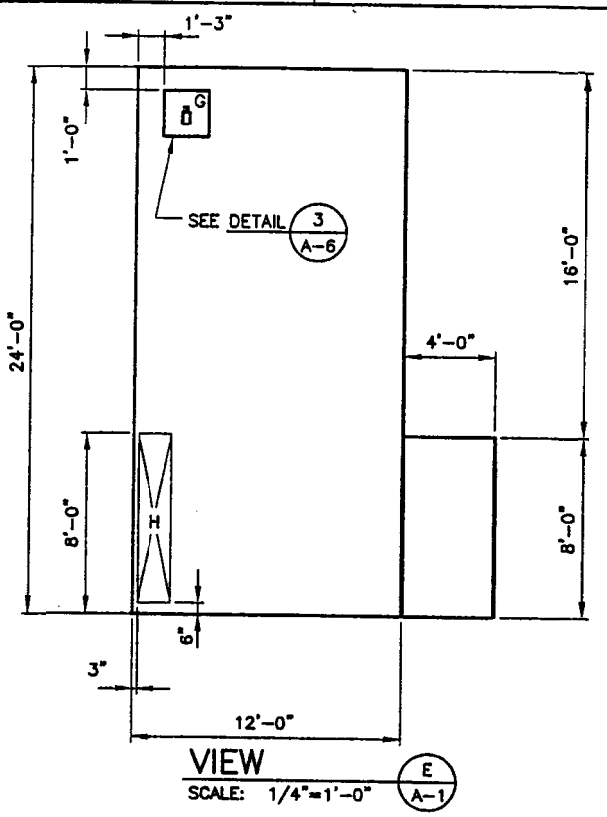

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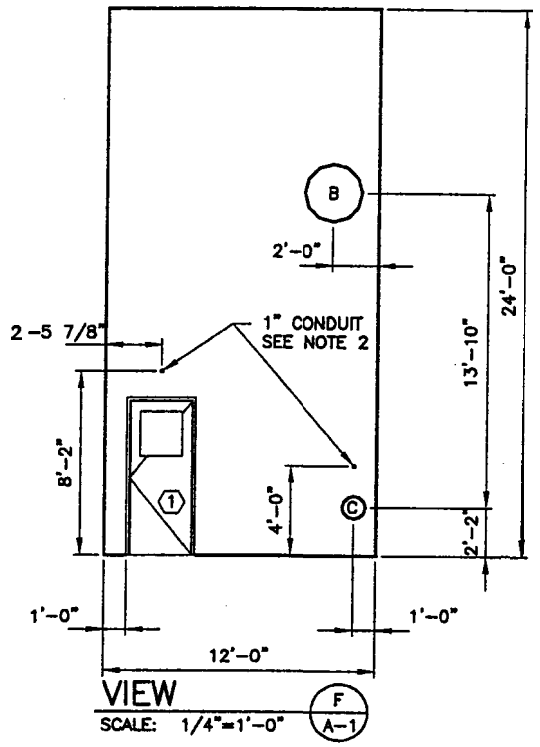

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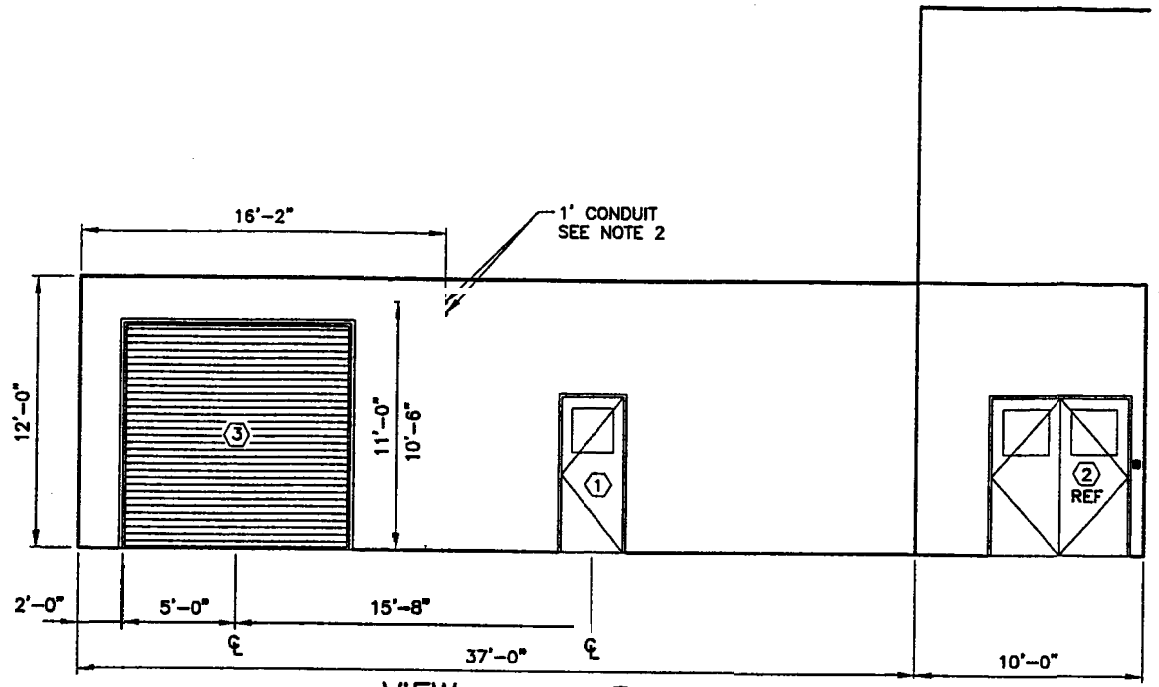

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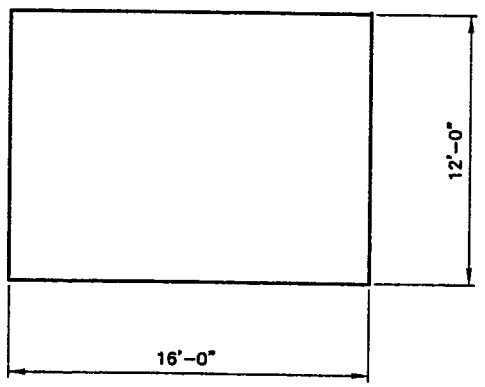
INFORMATION ONLY



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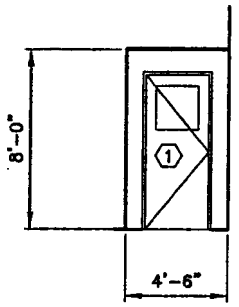

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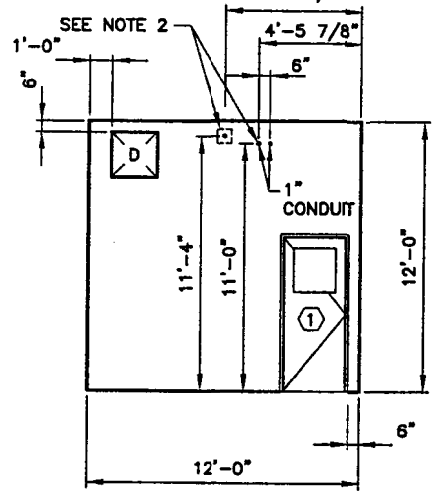

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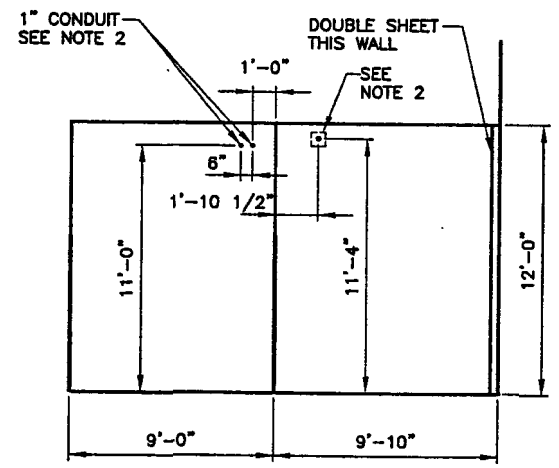

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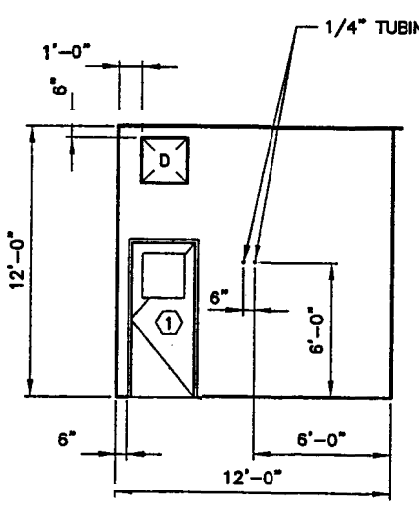

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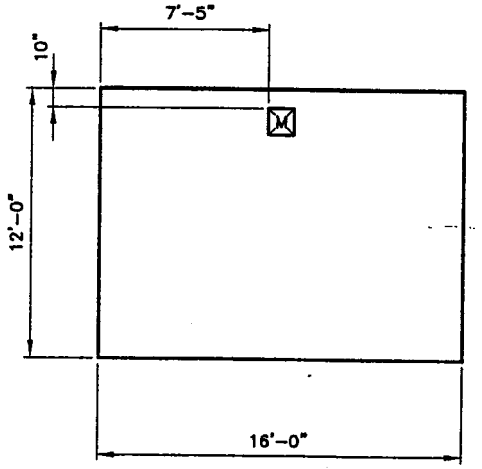

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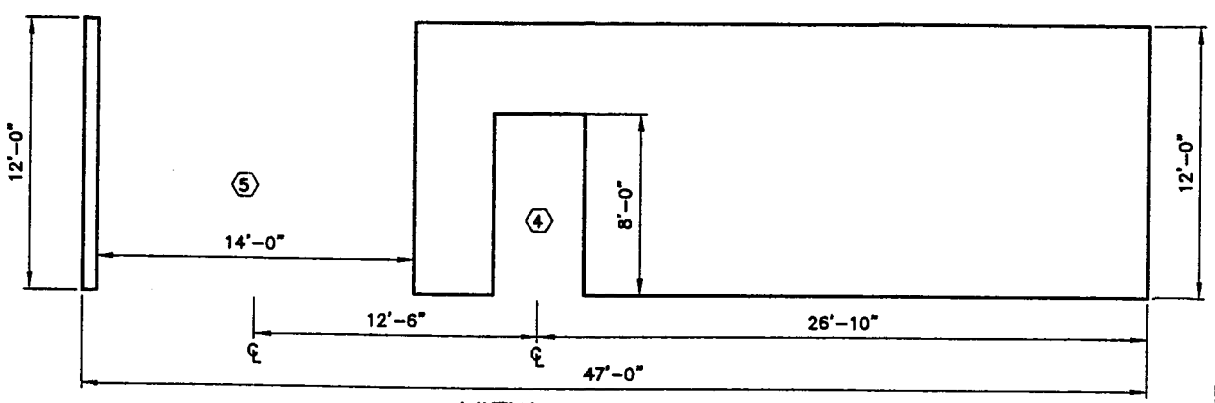

VIEW
SCALE: 1/4"=1'-0" P A-1

NOTES

1. DIMENSIONS ARE FROM INSIDE OF CLEAR OPENING TO INSIDE OF WALL (NOMINAL), OR FROM CENTERLINE TO FINISH FLOOR LEVEL (NOMINAL), OR FROM INSIDE OF CLEAR OPENING TO FINISH FLOOR LEVEL (NOMINAL).
2. REINFORCE THIS AREA FOR PENETRATIONS, (MIN. 16 GA PANEL MATERIAL), SEE SPECIFICATION FOR EXACT PENETRATION SIZES. PROVIDE ADEQUATE FRAMING SUPPORT. PENETRATIONS TO BE FIELD CUT BY OTHERS.

X- F DRAWING
671 (BOUND)

REVISION: 0
ORIGINAL SIGNED BY: SCOTT ALAN JENSEN
DATE ORIGINAL SIGNED: 4/9/02
SEAL NUMBER: 4003
ORIGINAL STORED AT: EROB DOCUMENT CONTROL

REGISTERED PROFESSIONAL ENGINEER 4003 STATE OF IDAHO SCOTT ALAN JENSEN

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FOR DRAWING INDEX SEE DRAWING NO. 519888	SUBCONTRACT NO. N/A
SCALE: 1/4" = 1'-0"	REQUESTER: S.A. DAVIES
	DESIGN: S. JENSEN
	DRAWN: B.SEARLE
	PROJECT NO. 021052
	SPEC CODE REC REL
DESIGN PHASE: PERF SPEC	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90072
SAFETY CATEGORY: SS	EFFECTIVE DATE: 4/9/02

INEEL — Idaho National Engineering & Environmental Laboratory, BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
RETRIEVAL CONFINEMENT STRUCTURE
VIEWS

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG-	REV
		AREA	TYPE	DL	DRG		
D	01MF3	098	0671	00	090	519893	

SCALE: NOTED SHEET A-5

FMT-01-REV 3.2

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:

FIRE PIPING GENERAL NOTES

1. DELUGE SYSTEM FOR THE RETRIEVAL CONFINEMENT STRUCTURE SHALL SHALL BE CLASSIFIED AS EXTRA HAZARD OCCUPANCY GROUP 1 PER NFPA.
2. PIPE FITTINGS SHALL BE GROOVED END CONNECTIONS EXCEPT FOR THE RCS DRY SYSTEM AND THE RCS MANUAL DELUGE SYSTEM THAT RUNS UNDERNEATH THE WES. THOSE SYSTEMS WILL HAVE BUTT WELDED END CONNECTIONS AND SOCKET WELDED END CONNECTIONS RESPECTIVELY. SEE SHEET FP-7 FOR MORE INFORMATION.
3. NONE OF THE FIRE PROTECTION SYSTEMS REQUIRE FREEZE PROTECTION.

LEGEND

- 4-WAY SWAY BRACE
- 2-WAY SWAY BRACE
- [X-XX] INDICATES CL PIPE ELEVATION ABOVE FINISHED FLOOR [FEET-INCHES]
- STANDARD UPRIGHT SPRINKLER
- STANDARD PENDENT SPRINKLER
- RISE UP: LINE SIZE (INCHES) X DISTANCE (FEET-INCHES)
- DROP DOWN: LINE SIZE (INCHES) X DISTANCE (FEET-INCHES)
- 1 1/4 / 0-6 — LINE SIZE (INCHES) / LINE LENGTH (FEET-INCHES)
- PIPE CAP
- SPRAY NOZZLE

ABBREVIATIONS

APPROX	APPROXIMATE
BW	BUTT WELD
CS	CARBON STEEL
DD	DROP DOWN
DIA	DIAMETER
FF	FLAT FACE
FNPT	FEMALE NATIONAL PIPE THREAD
GAL	GALLON
GALV	GALVANIZED
GRV	GROOVED
LG	LENGTH
LR	LONG RADIUS
NPT	NATIONAL PIPE THREAD
OD	OUTSIDE DIAMETER
REF	REFERENCE
RU	RISE UP
SCH	SCHEDULE
SST	STAINLESS STEEL
SW	SOCKET WELD
THD	THREADED
TYP	TYPICAL
W/N	WELDNECK

ACRONYMS

PGS	PACKAGING GLOVEBOX SYSTEM
RCS	RETRIEVAL CONFINEMENT STRUCTURE
WES	WEATHER ENCLOSURE STRUCTURE

INFORMATION ONLY

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FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A	INEEL (Idaho National Engineering & Environmental Laboratory) BECHTEL BWXT IDAHO, LLC
NO SCALE	REQUESTER: SA DAVIES DESIGN: JD JENSEN DRAWN: TB UMPHLETTE PROJECT NO. 021052 SPEC CODE REC REL	OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT WES / RCS / PGS GENERAL NOTES, LEGEND, ABBREVIATIONS AND ACRONYMS
DESIGN PHASE: PERF SPEC	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846	SIZE D; CAGE CODE 01MF3; INDEX CODE NUMBER AREA 098 TYPE 0671 CL 52 ORG 090; DWG-519941; REV
SAFETY CATEGORY: CG/SS	EFFECTIVE DATE:	SCALE: NONE; SHEET FP-1

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PMT-01-REV 3.2

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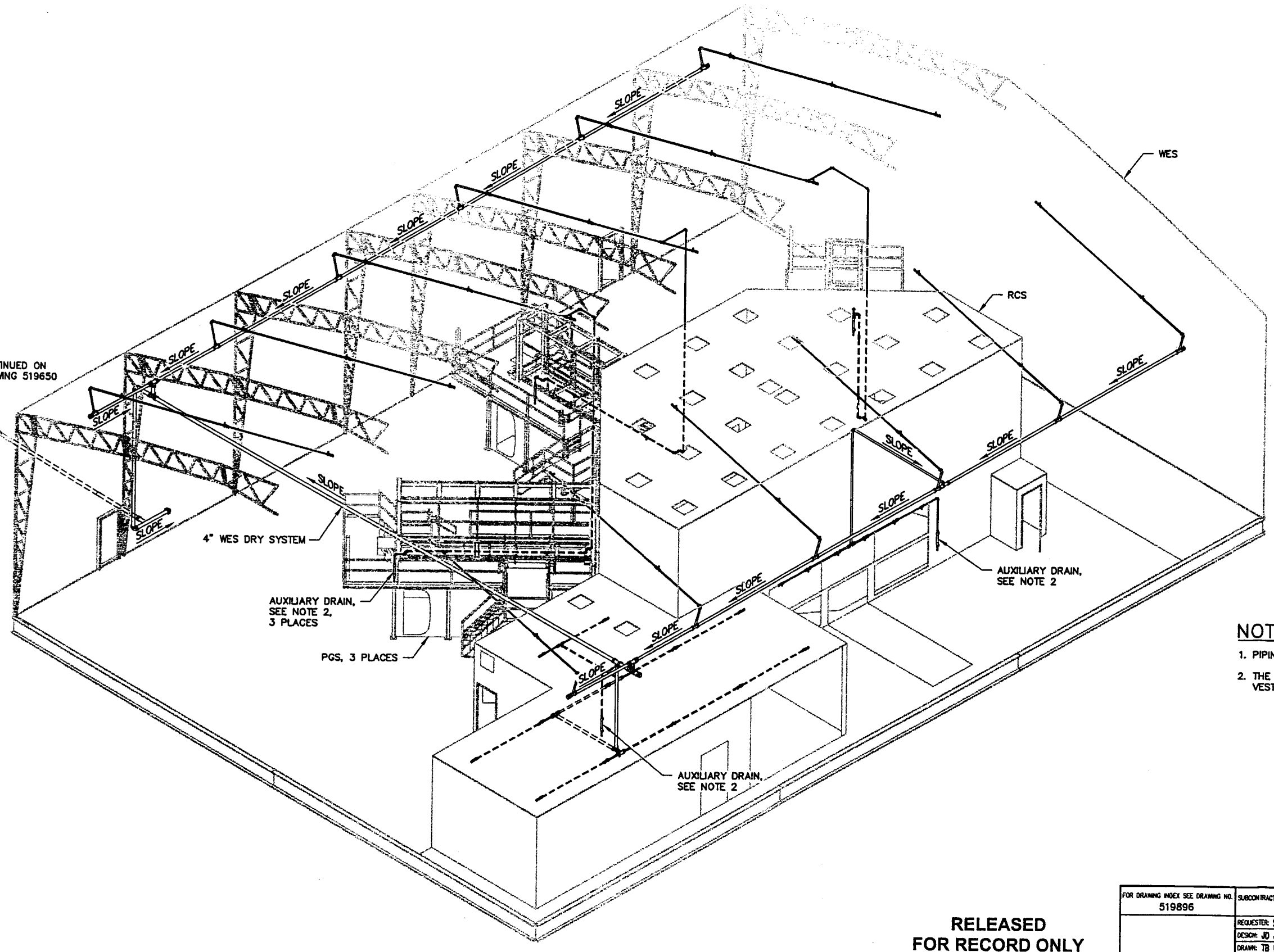

WES DRY FIRE PROTECTION SYSTEM ISOMETRIC

LOOKING SOUTHEAST

INFORMATION ONLY

NOTES

1. PIPING SHALL BE SLOPED DOWNARD 1/8" PER 1'-0" AS SHOWN.
2. THE SPRINKLER PIPING FOR THE WINDOWS AND FOR THE TRANSFER VESTIBULE IS TO BE SLOPED DOWNWARD TO THEIR AUXILIARY DRAIN.

X-REF DRAWING

519670 BOUND
519671 BOUND
519674 BOUND
519675 BOUND
519677 BOUND

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FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A	INEEL (Idaho National Engineering & Environmental Laboratory, BECHTEL BWXT IDAHO, LLC)
NO SCALE	REQUESTER: SA DAVIES DESIGN: JD JENSEN DRAWN: TB UMPHLETTE PROJECT NO. 021052 SPEC CODE	OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT WES WES ISOMETRIC
DESIGN PHASE: PERF SPEC SAFETY CATEGORY: CG	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846 EFFECTIVE DATE:	SIZE: D; CAGE CODE: 01MF3; INDEX CODE NUMBER: AREA 098, TYPE 0671, OL 52, ORG 090; DWG-519942; REV SCALE: NONE; SHEET FP-3

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DD 4x1-11 | DD 1x29-9 | DD 1x30-9 1/4 | DD 2x15-5 | DD 3x11-8 1/2 | DD 4x1-2 | DD 1 1/4x3-2 3/4 | DD 1 1/4x3-2 1/2 | DD 1 1/4x3-0 1/2 | DD 1 1/4x2-10 | DD 1 1/4x2-8 | DD 1 1/4x2-5 3/4

6 PLACES | 6 PLACES | TRUSS, TYP | WES

70-10 1/4 | 17-0 1/2

SECTION (A/–)
SCALE: 3/4"=1'-0"

INFORMATION ONLY

X-REF DRAWING
519675 BOUND
519677 BOUND

WES DRY FIRE PROTECTION SYSTEMS PLAN
SCALE: 3/16"=1'-0"

RELEASED FOR RECORD ONLY
DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A
SCALE: 3/16" = 1'-0"	REQUESTER: SA DAVIES
SCALE: 3/4" = 1'-0"	DESIGN: JD JENSEN
	DRAWN: TB UMPHLETTE
	PROJECT NO. 021052
	SPEC CODE REC REL
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846	
DESIGN PHASE: PERF SPEC	
SAFETY CATEGORY: CG	EFFECTIVE DATE:

INEEL — Idaho National Engineering & Environmental Laboratory — BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WES

WES UPPER PLAN

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG-519943	REV
		AREA	TYPE	FC	ORG		
D	01MF3	098	0671	52	090		

SCALE: NOTED | SHEET FP-4

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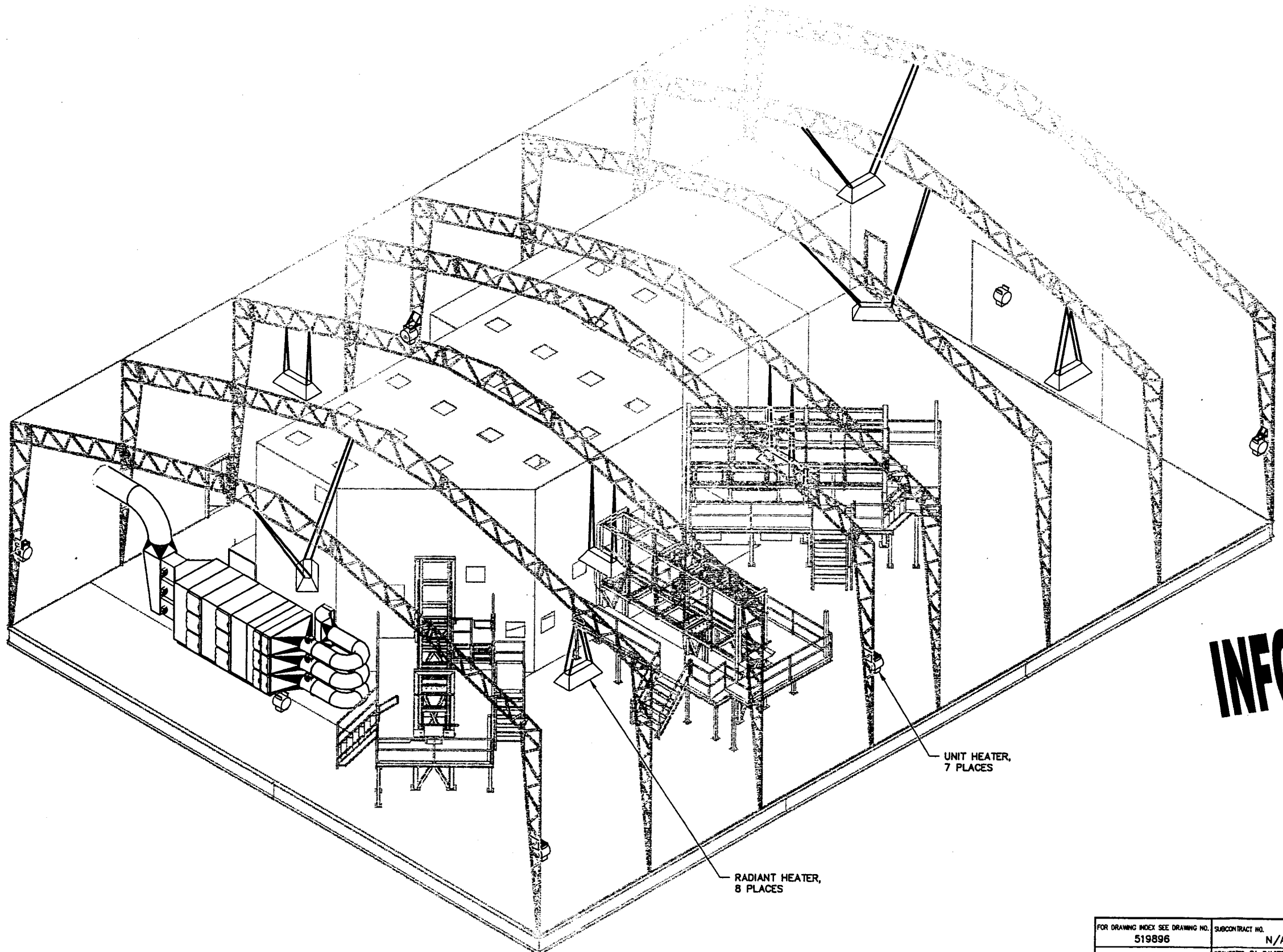
PWT-01-REV 3.2

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:



INFORMATION ONLY

X-REF DRAWING

519670 BOUND
519671 BOUND
519674 BOUND
519677 BOUND
519862 BOUND

FACILITY VENTILATION ISOMETRIC

LOOKING NORTHWEST

RELEASED FOR RECORD ONLY

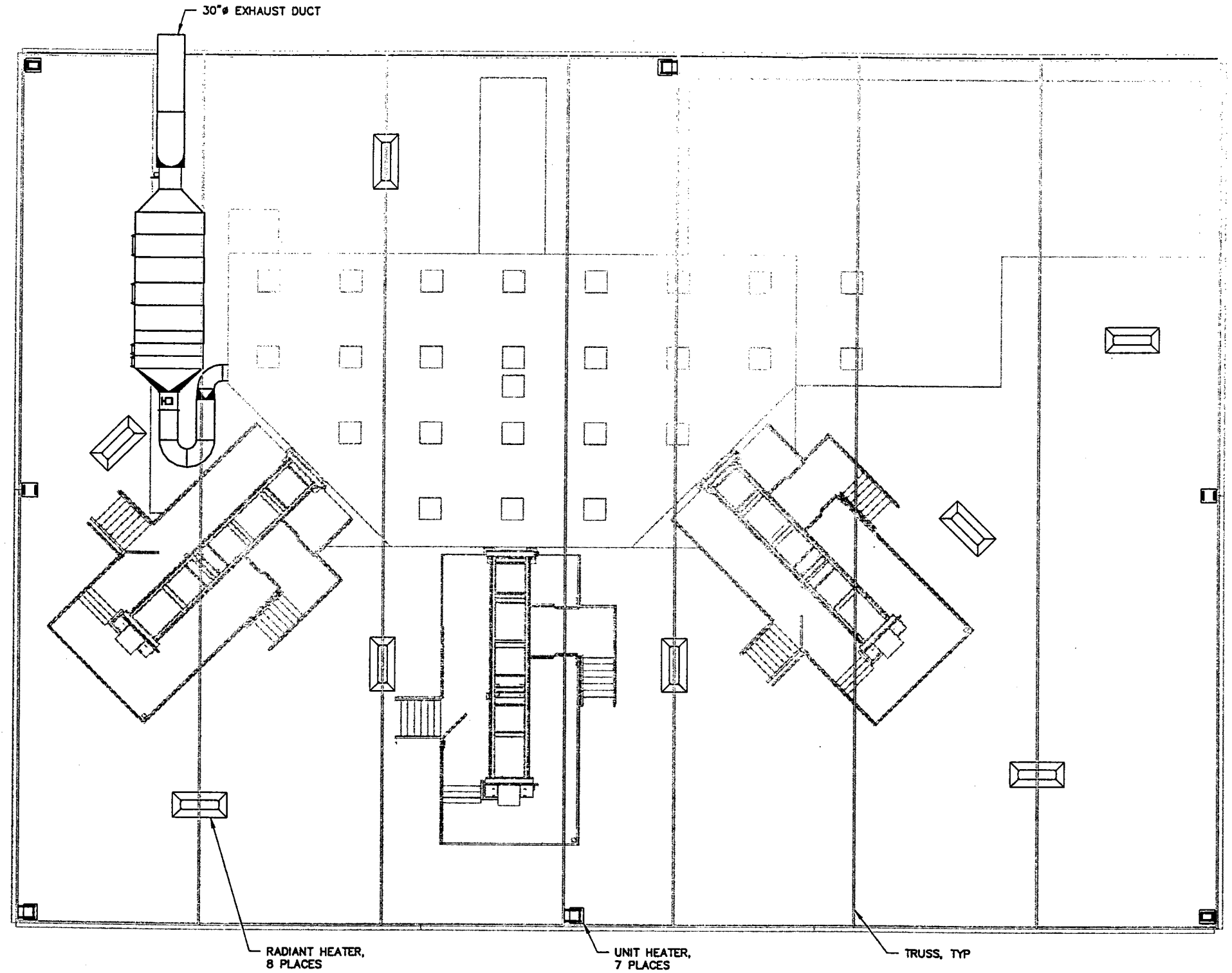
DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A	INEEL Idaho National Engineering & Environmental Laboratory, BECHTEL BWXT IDAHO, LLC
NO SCALE	REQUESTER: SA DAVIES DESIGN: MI POPE DRAWN: TB UMPHLETTE PROJECT NO. 021052 SPEC CODE REC REL	OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT WES / RCS / PGS FACILITY VENTILATION ISOMETRIC
DESIGN PHASE: PERF SPEC	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846	SIZE D; CAGE CODE 01MF3; INDEX CODE NUMBER AREA 098 TYPE 0671 CL CL ORG 090; DWG-519944; REV
SAFETY CATEGORY: CG/SS	EFFECTIVE DATE:	SCALE: NONE; SHEET HV-3

File: 519944.DWG Path: V:\WES_PERF_SPEC
Layout Name: Layout1 Date: 05/09/02 - 4:51 P.M.
ID: ABE

FMT-01-REV 3.2

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:



FACILITY VENTILATION PLAN

INFORMATION ONLY

X-REF DRAWING

519670 BOUND
519671 BOUND
519674 BOUND
519677 BOUND
519862 BOUND

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A	INEEL (Idaho National Engineering & Environmental Laboratory) BECHTEL BWXT IDAHO, LLC
NO SCALE	REQUESTER: SA DAVIES DESIGN: MI POPE DRAWN: TB UMPHLETTE PROJECT NO. 021052 SPEC CODE REC REL	OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT WES / RCS / PGS FACILITY VENTILATION ISOMETRIC
DESIGN PHASE: PERF SPEC	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 90846	SIZE D; CAGE CODE 01MF3; INDEX CODE NUMBER AREA 098 SYS 0671 CL OBJ 090; DWG-519945; REV
SAFETY CATEGORY: CG/SS	EFFECTIVE DATE:	SCALE: 3/16"=1'-0"; SHEET HV-4

File: 519945.DWG ID: ABE
Path: V:\WES_PERF_SPEC
Layout Name: Layout1
Date: 05/09/02 - 4:59 P.M.

PMT-01-REV 3.3

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:

LUMARK WL WAL-PAK, METAL HALIDE, WALL MOUNT LIGHT, COOPER LIGHTING. MOUNT LIGHT ON TRUSS OR PROVIDE A SUPPORT AS CLOSE TO EACH PERSONNEL DOOR OR OVERHEAD DOOR AS POSSIBLE, LIGHT WEIGHTS APPROXIMATELY 42 POUNDS, 5 PLACES

VENTILATED TROUGH CABLE TRAY AND APPROXIMATELY 10-1" CONDUITS SHALL BE SUPPORTED FROM TRUSS AND INTERMEDIATE SUPORTS SHALL BE PROVIDED AS REQUIRED TO MAINTAIN A MAXIMUM OF 10'-0" BETWEEN SUPPORTS. SEE NOTE 3

A / E-2

LUMARK WL WAL-PAK, METAL HALIDE, WALL MOUNT LIGHT, COOPER LIGHTING. MOUNT LIGHTS ON TRUSS AS SHOWN, LIGHT WEIGHTS APPROXIMATELY 42 POUNDS, 12 PLACES

LUMARK E&G STEELER METAL HALIDE LIGHT, COOPER LIGHTING. MOUNT FROM TRUSS, EACH LIGHT WEIGHTS APPROXIMATELY 40 POUNDS 32 PLACES

METALUX INDUSTRIAL/VAPORTITE, 4 FOOT LIGHT SUPENDED FROM TRUSS, EACH LIGHT WEIGHS APPROXIMATELY 16 POUNDS, 8 PLACES

80'-2"

110'-1"

NOTES

1. THIS DRAWING IS FOR INFORMATION ONLY TO ILLUSTRATE THE LOCATIONS OF LIGHTS, MAJOR CONDUITS AND CABLE TRAY. NOT ALL CONDUIT AND SURFACE MOUNTED DEVICE BOXES, SEALED FITTINGS, ACCESSORIES AND SUPPORTS ARE SHOWN.
2. ALL EQUIPMENT SHOWN SHALL BE INSTALLED BY OTHERS.
3. SUPPORTS SHAL BE DESIGNED FOR A LOADING OF 150 LBS PER LINEAR FOOT FOR THE CABLE TRAY AND 150 LBS PER LINEAR FOOT FOR THE CONDUIT BANK.

INFORMATION ONLY

X-REF DRAWINGS

519671-2 (BOUND)
519677 (BOUND)

FLOOR PLAN

SCALE: 3/16" = 1'-0"

RELEASED FOR RECORD ONLY

DO NOT FABRICATE

FOR DRAWING INDEX SEE DRAWING NO. 519896	SUBCONTRACT NO. N/A
SCALE: 3/16" = 1'-0"	REQUESTER: S A DAVIES
	DESIGN: J E DUGGAN
	DRAWN: D.H. MANWILL/R. WATSON
	PROJECT NO. 021052
	SPEC CODE REC REL
DESIGN PHASE: PERF SPEC	FOR REVIEW/APPROVAL SIGNATURES SEE BAR NO. 90846
SAFETY CATEGORY: LSC	EFFECTIVE DATE:

INEEL — Idaho National Engineering & Environmental Laboratory, BECHTEL BWXT IDAHO, LLC

OU 7-10
GLOVEBOX EXCAVATOR METHOD PROJECT
WEATHER ENCLOSURE STRUCTURE

LIGHTING PLAN, INFORMATION ONLY

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG	REV
		AREA	TYPE	CL	ORG		
D	01MF3	098	0671	10	090	519939	

SCALE: 3/16"=1'-0" SHEET E-1

File: 519939.dwg
Path: V:\WES_PERF_SPEC
Layout Name: WES_PERF_E-1 | ID: ABE
Date: 05/09/02 - 4:33 P.M.